DOCUMENT RESUME

ED 435 045 CE 079 317

AUTHOR	Clarke, Alan; Walmsley, Joyce
TITLE	Open Learning Materials and Learning Centres.
INSTITUTION	National Inst. of Adult Continuing Education, Leicester (England).
SPONS AGENCY	Department for Education and Employment, London (England).
REPORT NO	ISBN-1-86201-071-4
PUB DATE	1999-00-00
NOTE	65p.
AVAILABLE FROM	National Institute of Adult Continuing Education, 21 De Montfort Street, Leicester LE1 7GE, United Kingdom (6.95 British pounds).
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	EDRS Price MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Academic Standards; *Adult Learning; Basic Skills; Career Counseling; Case Studies; Community Centers; Community Education; Computer Uses in Education; Counseling Services; Definitions; *Delivery Systems; Distance Education; Education Work Relationship; Educational Media; *Educational Practices; Educational Quality; Educational Technology; Educational Trends; Foreign Countries; Information Technology; *Instructional Materials; Learning Centers (Classroom); Libraries; Online Systems; *Open Education; Postsecondary Education; Private Sector; Program Costs; Public Schools; Rural Education; School Business Relationship; Services; Trend Analysis; Tutors; Urban Education
IDENTIFIERS	*Great Britain; National Vocational Qualifications (England); *Open Learning; Place Based Education

ABSTRACT

The availability and nature of open learning materials and centers in Great Britain were examined in a study that focused on the following: the open learning market; learning materials; commercial suppliers; basic skills materials; information technology materials; online learning; information technology and tutors; qualifications; prices; quality; standards; support; and learning centers. The research included case studies of open learning programs offered in rural and urban community learning centers, libraries, commercial enterprises, colleges, a university, and a career service. Key findings included the following: (1) Great Britain's open learning market is complex and divided into several sectors, including further education, higher education, training, individuals, and schools; (2) of the 20,000-25,000 open learning packages available in Great Britain, approximately 5,000 are computer-based packages; (3) the availability of open learning is clearly skewed in a manner dictated by market forces; (4) relatively few materials are related to basic skills development or achieving a National Vocational Qualification; (5) open learning materials are available in a wide range of media; (6) locating open learning materials is not always a straightforward process; (7) learning centers have become widely available in all sectors; and (8) the quality of open learning varies widely. (Contains 37 references.) (MN)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 435 045

NIACE

D/EE

OPEN LEARNING MATERIALS and learning centres

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY
P Moleoina
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
2A

ALAN CLARKE AND JOYCE WALMSLEY

CE079 317

Open Learning Materials and Learning Centres

OPEN LEARNING MATERIALS AND LEARNING CENTRES

Alan Clarke
and
Joyce Walmsley

D/EE
Department for Education and Employment

NIACE
THE NATIONAL ORGANISATION FOR ADULT LEARNING

Published by the National Institute of
Adult Continuing Education (England and Wales)

21 De Montfort Street
Leicester LE1 7GE
Company registration no. 2603322
Charity registration no. 1002775

First published 1999

1999 © National Institute of Adult Continuing Education
(England and Wales)

All rights reserved. No reproduction, copy or transmission of this publication may be made without the written permission of the publishers, save in accordance with the provisions of the Copyright, Designs and Patents Act 1988, or under the terms of any licence permitting limited copying issued by the Copyright Licensing Agency.

NIACE, the national organisation for adult learning, has a broad remit to promote lifelong learning opportunities for adults. NIACE works to develop increased participation in education and training, particularly for those who do not have easy access because of barriers of class, gender, age, race, language and culture, learning difficulties and disabilities, or insufficient financial resources.

NIACE's website on the Internet is http://www.niace.org.uk

Cataloguing in Publication Data
A CIP record of this title is available from the British Library
ISBN 1 86201 071 4

Designed and Typeset by Cyclops Multimedia Productions
Printed in Great Britain by Russell Press

Contents

Acknowledgements vi
Executive summary vii

Introduction 1
1 What is open learning? 2
2 Why use open learning? 4
3 The open learning market 5
4 Learning materials 13
5 Commercial suppliers 16
6 Basic skills materials 18
7 Information technology materials 21
8 On-line learning 23
9 Information technology and tutors 26
10 Qualifications 27
11 Prices 30
12 Quality 32
13 Standards 34
14 Support 35
15 Learning centres 37
16 Case studies 40
17 Summary of Key Findings 51
18 References 53

List of Tables

Table 1 Definition of open learning 3
Table 2 Proportion of library authorities stocking open learning materials 9
Table 3 Nature of learning materials 13
Table 4 BASE 1997 survey of markets 17
Table 5 Matching programme databases 28
Table 6 Software authoring tool – education, corporate and licensing 30
Table 7 Development time for different media 31

ACKNOWLEDGEMENTS

This report is the outcome of an investigation into open learning materials and centres undertaken on behalf of the Department for Education and Employment. We would like to thank the Department for their permission to publish the report and their support in carrying out the project.

A special acknowledgement is due to Alastair Thomson, Jackie Essom, Stephen McNair, Victoria Forty and Phil Samuels who made many valuable contributions to the project.

We would like to thank the following for their contribution to this project:

Marie Allen (Liverpool Community College), John Allred, Julie Bannister (Alstrom), Lesley Blundell (Stroud College), Helen Bullough (NormidTEC), Pam Claire (Warwickshire Career Service), Irene Cooke (BAOL), Tony Croft (Loughborough University), Pat Cummins (Stockton on line), Kevin Donovan (FEDA), Jo Freeman (BGT Technologies), Andrew Green (Liverpool Library), David Hardy (Open Learning Foundation), Wing Commander Hill (RAF), David Holland (FE National Consortium), Jenny Hunt (BBC), Janet Lay (Coventry and Warwickshire CTEC), Roy Leece (BOLDU), Jean MacDonald (BECTA), Claire Mckenzie (COTU), Roger Merritt (NEC), Molly Oatley, Jim Pateman (Basic Skills Agency), Marcos Tiris (FEDA), John Twining (Technologies for Training), Europe Singh (BBC), Seb Schmoller (Sheffield College), Margaret Smith (Warwickshire Careers Service), Peter Sinclair (BOLDU) and Winnie Wade (Loughborough University).

1. Great Britain has a long and successful history of employing open and distance learning methods. This has created an industry of many small commercial organisations, large corporate users, universities and colleges with considerable expertise in open learning. The industry is supported by a group of self-employed individuals who offer a range of specialist skills.

2. Suppliers tend to specialise to some extent in particular sectors of the market or in supplying certain types of service. The services include:

   - distribution of third party products
   - bespoke development of learning materials
   - consultancy
   - demonstration centres
   - identification of materials
   - publishing of materials

3. The open learning market is complex and divided into several sectors including FE, HE, training, individuals and schools. The sectors operate partly independently and to some extent in partnership. Some sectors are mature markets (e.g. training) while others are new and developing (e.g. individual). The flow of information between and within sectors is often fragmented.

4. It is likely that if we take a broad view of what constitutes open learning there are probably 20,000 to 25,000 commercially available packages, of which 5,000 are computer-based products. The current rate of development of material is equally split between computer-based and text-based materials. In many cases computer-based materials also include other media such as linked workbooks.

5. The availability of open learning is clearly skewed, certain subjects being widely available while other areas are largely ignored. This is almost certainly linked to market forces. There are many titles relating to management/business training, information technology and foreign languages. These subjects have either a consistent demand (e.g. languages) or a market willing to pay a high price for quality products (e.g. management training) or both (e.g. information technology).

6. The availability of open learning materials related to basic skills development is limited. In contrast, learning materials related to learning how to use IT applications are readily available except for packages aimed at new computer users.

7. Open learning material employs a wide range of media including paper, audio cassettes, video, computer-based learning and multimedia. The overwhelming majority of packs are based on written materials.

8. Locating open learning materials is not always straightforward in that there is no one catalogue or list of available material. To obtain lists of a majority of open learning materials requires the use of several individual CD-ROM databases combined with the use of a range of supplier catalogues. Most commercial buyers rely on the services of a distributor who locates and supplies them with material to meet their needs. Identification of suitable material in other sectors appears to be based on word-of-mouth recommendations, specialist centres (e.g. CTI), advertisements and reviews. It is not easy to locate material or even to be certain that products exist.

9. In addition to commercial producers of open learning, a large volume of learning material is produced by individual teachers and trainers. This is often in the form of workbooks, handouts and worksheets. However, individuals have also created multimedia products and other forms of computer-based learning including on-line materials.

10. In both FE and HE, organisations have been established based on groups of colleges and universities to aid the development of open learning materials. In the FE sector the FE national consortium has a membership of 160 colleges while in the HE sector the Open Learning Foundation has 26 full and 12 associated members. Both organisations have produced large quantities of text-based open learning.

11. Learning centres have become widely available in all sectors. It is rare to find a college, university or large employer that has not developed at least one centre and many large companies have opened whole networks of centres.

12. Learning centres come in a wide range of sizes, shapes and configurations. In some companies a simple cabinet of learning materials is called a learning centre, while several universities have centres based in multi-storey buildings with hundreds of computers linked to the Internet with sophisticated support mechanisms. Several organisations are moving towards integrating their whole site as a learning centre based on a local network or intranet, while several commercial organisations have launched what could be called virtual learning resource centres where customers can download material directly to their own computer.

13. There are a number of approaches to supporting learning by the use of computer and communication technologies. The main ones are:

- simple delivery of the learning materials to the learner
- lecture notes and visual aids placed on the web, Intranet or network to aid students
- the WWW library of resources (e.g. electronic journals, online databases, reports and references)
- communication links between student and tutor (i.e. supporting learning)
- communication links between learners to provide mutual support (e.g. conferences, mailgroups and bulletin boards)
- communication links between tutors
- frequently asked questions
- interactive learning on-line (i.e. learners work with a package at a remote location)
- computer learning environments (e.g. microworlds)
- computer-assisted assessment
- virtual seminars and conferences
- video conferencing to provide face-to-face support to learners in remote locations.

14. There is significant interest in using on-line methods to deliver and support learning in all sectors of the market. Many commercial companies have or are planning to launch an on-line service. This is frequently related to the delivery of packages. In FE and HE there has been a rapid and continuing growth in the development of websites, intranets and the development of on-line courses.

15. The impact on a teacher, tutor or trainer of introducing ICT to their teaching methods is significant and should not be underestimated. Most tutors who are using ICT are enthusiasts. Other teachers, tutors and trainers will need to be persuaded to change their methods and take part in the retraining if they are to successfully employ ICT. The training will depend on how ICT is going to be used. The first step is certainly to develop confident users of ICT. However, this needs to be followed by specific training to help tutors use ICT to deliver and support learning.

16. Many open learning packs are not related to the achievement of a qualification and there is relatively little material aimed at supporting a learner to achieve an NVQ. However, in theory, open learning should be a suitable approach to achieving a qualification and in particular to supporting a working learner owing to its flexibility.

17. The quality of open learning is complex and is not simply about the quality of the learning materials. It depends on other factors including:

- the level and competence of support for the learners. This can be critical even with the best materials.
- the quality of the surrounding service (e.g. the administration, record keeping, advice and guidance).
- the impact of learner expectations and the role of the learner in the learning process.
- how the materials are used.

18. The development of standards for computer-based learning materials and systems is a critical factor in the creation of a worldwide learning market.

19. It is vital to provide support for open learners. Without support many learners are likely to fail to complete their course of study or to require excessive time. Appropriate human support is important to reducing these problems.

INTRODUCTION

This report is the outcome of an investigation into the UK open learning market undertaken on behalf of the Department for Education and Employment. The project was carried out between May and October 1998 and concentrated on open learning materials and learning centres. The project staff visited a range of learning centres serving many different groups and needs in colleges, universities, companies, libraries, careers officers and community locations. Some centres specialised in particular subjects (e.g. basic skills) while others offered a range of materials and services. Size, service and relationship to the host organisation varied across the sample from centres serving a small rural community to those designed to support thousands of learners.

In parallel the project attempted to analyse the nature of the national open learning resource by meetings with many organisations involved in the market and reviewing databases and catalogues of material. Learning centre staff were asked for their views of the market and available material.

To support both aspects of the project an extensive review of the literature was carried out.

1

WHAT IS OPEN LEARNING?

The terms 'open learning', 'flexible learning, 'computer-based learning', 'on-line learning' and 'distance learning' are often used, abused, merged and stretched until they have almost come to mean whatever the speaker/writer wants them to mean. They are all broad terms which potentially can include a wide range of approaches. It is clear that organisations that are seeking to realise the power of information and communication technologies (ICT) often develop new terminology to better describe their approach and differentiate it from more traditional methods. However, some of the evidence relating to ICT approaches considered during this project appears to ignore the large volume of research and experience in traditional open and distance learning. The majority of this body of evidence does not involve methods which include the use of ICT. However, it does consider the major issues of the learner who is working at a distance, in a learning centre, in some flexible way outside of a classroom and the integration of new methods into the classroom. ICT is frequently described as having the potential to remove barriers and enhance learning. This is undoubtedly true, but the task will be made easier by incorporating the evidence from earlier work. There is no need to duplicate this earlier work.

Open learning can be considered at two levels:

- reducing or eliminating barriers to learning caused by financial constraints, timing, location, entry qualification requirements and structure of courses which keep various groups out of education and training.
- contributing to a more learner-directed or learner-centred provision in which the learner decides what, where and how the learning will take place.

Both levels are ideals as in practice open learning still involves the learner in choosing between different compromises, since many providers are unable to offer complete flexibility. Information and communication technology does have the potential to make positive contributions to both levels of open learning. In this report we will use open learning as a general all-embracing term.

One of the best accepted definitions of open learning is that offered by Roger Lewis (1986). An abbreviated version is given in Table 1 which compares open and closed learning.

Table 1 Definition of open learning

Basic question	Closed	Open
Who can learn?	Select groups, entry conditions	Open to all
Why learn?		Learner's own choice and motivation
What can be learned?	Fixed syllabus, governed by others, e.g. employers non-negotiable	Learner choice
How learning is delivered?	One fixed approach, one route through materials	Choice of styles, methods, order etc.
Where does learning occur?	One place only	Learner chooses
When is learning offered?	Fixed times, start/end dates	Learner's choice of time and pace
How are progress and assessment ensured?	Fixed times and methods, summative only	Variety of methods, learner's choice of time and approach
Who can help?	Fixed approach, provider only	Variety of support options, learner's choice
Where does it lead?	One destination	Various possible destinations

Although Lewis's work dates from the early 1980s, it is important to note that the barriers to learning which he identified, and which prompted his model, are similar to those identified in the University for Industry Pathfinder Prospectus (DfEE, 1998a) – that is, cost, fear, complexity, inconvenience, time and information.

Learning centres are often closely identified with open learning, and there is considerable interest in developing centres in many different types of organisation. However, what constitutes a learning centre can be defined in a wide variety of ways. It is clear that centres need to reflect the needs of the individual and the organisation in which they are based (Cambridge Learning Systems Ltd, 1997). This results in a wide range of centres which differ in size, resource and role. Some centres will simply offer access to a collection of learning materials from which learners can borrow packs to work on at home or in the workplace. Other centres will provide significant services to the learner in addition to learning materials. These may include guidance, general and specific tutorial support, private study areas and mentoring.

Information and communication technology can simply be another resource provided within the centre so that computer-based learning materials can be studied. However, there is considerable interest in developing centres which are accessed through ICT – that is, virtual centres which exist on the World Wide Web or on intranets but have no physical presence. The great advantage is that a virtual centre can be accessed from anywhere and there is no need to visit the centre in person. The limitations of place, capacity and opening hours are removed. However, virtual centres are a new development and relatively little practical experience is available to judge their effectiveness.

2

WHY USE OPEN LEARNING?

During discussions, the interest and motives of learning centre staff, suppliers and developers of learning materials in using open learning or developing learning centres were probed. In most cases the reasons given were linked to the basic objectives of open learning to remove barriers which face learners. Everyone had many anecdotal examples to give of the effectiveness of their centres' efforts to achieve this goal. In addition some centres clearly had wider objectives such as helping to create teleworking opportunities in their community or developing a learning culture in their organisation.

The success of centres as judged by the centre staff was based on a number of factors such as:

- the number of people using the centre
- repeated use of the facilities
- the contribution the centre was making to wider objectives
- satisfaction with services as expressed by the learners or their managers in the case of company-based centres
- replacing external training courses with open learning materials (i.e. direct cost saving)

In most cases basic evaluation information was recorded but only a few centres appeared to have detailed systematic evaluation procedures in place.

A cross-section of people interviewed raised the issue of cost-effectiveness and there was clearly a widespread belief that open learning was a cost-effective approach. The practical definitions of cost-effectiveness which centre staff were employing to reach this conclusion clearly varied from simply reducing expenditure to considering the wider learning benefits of open learning. However, few centres had systems in place to systematically judge cost-effectiveness – although interest in cost-effective evidence from other sources was actively sought.

3 THE OPEN LEARNING MARKET

The open learning market can be divided into a number of sub-markets or sectors:

- further education
- higher education
- individual/home
- training
- schools.

Each sub-market has its own features, suppliers and important organisations in relation to open learning materials. There are relationships between different sectors and common suppliers and organisations, but in many ways each sector operates in isolation. In particular, the flow of information and understanding between sectors is limited and thus the opportunity to learn from each other's experience is often lost. The sectors can often be divided again into sub-sectors, and again communication within a sector is partial: the market is therefore complex and should not be treated as a single organism.

Further education

A survey (NEC, 1997) reported that two-thirds of FE colleges offered some form of open and distance learning, although in most cases on a small scale. Many colleges have established learning centres during the last ten years and there is considerable interest in the use of on-line learning approaches in this sector. This is demonstrated by the substantial development of networks, websites and intranets. A number of individual colleges and consortia are developing on-line learning systems of different types (e.g. GO – Getting Online – City College Manchester, Northern College Network – FE Colleges in the North East and Trojan – West Yorkshire Colleges).

Most colleges have a large amount of learning material which has been produced by individual tutors for their own use. This material is in the form of handouts, worksheets, booklets and books. The majority of the material is not designed for third party use or as open learning material. There have been attempts in a small number of colleges to store this material electronically on networks or intranets. Sheffield College (1997) carried out an audit of learning resources to support the development of ICT knowledge and skills within SMEs. The audit identified a large volume of materials of all types, both commercially available packages and materials produced within the college. The materials used a variety of media and methods. Although Sheffield College is a large institution it is likely that similar results could be found in many other colleges.

Teachers often comment that obtaining high quality computer-based learning (CBL) materials is difficult due to a number of factors. These include (FEFC, 1998):

- cost (CBL is often expensive)
- a limited range of titles
- the material cannot be modified to make it suitable for a wider range of abilities or different styles of learning.

Many colleges have purchased a range of CBL in the form of CD-ROMs which are accessed either over the college network or on stand-alone computers, often in the learning centre or college library. FEFC (1998) reported that 40 per cent of colleges from a survey of 44 colleges made CD-ROMs available over their networks and 60 per cent on single computers. The trend is clearly towards networking learning resources to make them more accessible. However, many college networks cannot deliver multimedia resources effectively owing to bandwidth restrictions which limit the delivery of multimedia CD-ROMs. There are examples of colleges and commercial companies who have successfully networked large numbers of CD-ROMs by enhancing their overall network (e.g. Llandrillo College) or by implementing a specific learning centre-only network (e.g. Ford EDAP, Dagenham). One successful approach is based on copying the entire contents of the CD-ROM to a large magnetic disk to improve the speed of delivery. However, this does assume that copyright licensing allows the centre to copy the CD-ROM.

Colleges are providing access to learning materials of all types through resource centres which are available for whole class and individual use. Centres are increasingly open for long hours during the week and on Saturday mornings. Learning centres have also been established in community locations and in some cases have telecommunication links to the main site. In some colleges, centres also provide for the hire or loan of laptops, either for a small charge or free to students with no access to computers at home. The prime use of these machines appears to be for the presentation of students' work (e.g. word-processing) rather than access to CBL materials.

A few individual colleges and consortia of colleges have developed commercial products. However, the high cost of producing commercial products (e.g. the development of a multimedia CD-ROM could cost around £100,000), the enormous time resource required (e.g. 100 to 400 hours of effort for each hour of learning) and the limited availability of design and other relevant skills make this a difficult choice. In many colleges individual enthusiasts have used authoring systems to produce CBL materials, and colleges often have good resources in the form of studios and editing facilities (FEFC, 1998) to support small-scale developments.

The Further Education National Consortium (FENC) is a national consortium of FE Colleges with members in England, Wales and Northern Ireland and an agreement to collaborate with a smaller Scottish Consortium called COLEG. At the moment (July 1998) FENC has 160 to 170 members. Members join FENC on a year to year basis and pay an annual subscription: new members pay £5,500 and renewal membership costs £4,500.

Members are provided with access to around 1,600 learning packages. These are available on CD-ROMs in a range of formats (Adobe Acrobat, Pagemaker or Word). Almost all the material was designed to be available as paper-based resources, but the use of Adobe Acrobat has extended and widened the use of the material. FENC material can be adapted by members to meet their precise needs. In addition, consortium members have access to various third party products at a discount. All FENC material is only available to Consortium members and essentially membership fees are a form of licence to use the resource during the period of membership. Membership is open to any organisation receiving funding from FEFC. Materials can be used by any members of staff working for a member organisation assisting registered students.

FENC have developed a system called Quanta. This is a new product which enables users to search the entire materials resource to identify materials which may meet their needs. This allows materials designed for one subject area to be used in another – in a sense, a 'pick and mix' approach to the entire resource, allowing customisation of products to meet new needs.

Many open learning suppliers have been offering a similar service for commercial customers based on an expert undertaking to identify a mixture of materials to meet a particular need. Many sources provide anecdotal evidence that tutors want to be able to adapt learning materials to meet their precise needs and approach.

A key role is played within FE by the FE Development Agency (FEDA) which provides a service to support the dissemination of good practice across the sector to aid the development of open learning. This is particularly focused on the use of computer-based approaches including on-line learning. FEDA operates a programme of seminars and events to train FE staff in the new approaches and to share experience. In addition, the agency is developing case studies and supporting development work.

Higher education

There is considerable interest in the use of open learning within higher education. However, the scope and nature of developments varies between different establishments and between departments within a single university. A number of central initiatives have been undertaken to disseminate information, develop materials and encourage the informed use of open learning and computer-based learning.

A network of 24 Computers in Teaching Initiative (CTI) subject centres based in universities throughout Great Britain can provide information on the availability and use of materials in relation to particular subjects. CTI has an excellent reputation within HE. The subject focus of CTI reflects the structure of HE where most staff relate to their own discipline and prefer to design their own courses and materials. This is not particularly different from FE (or even company training) but does pose a key issue to any organisation producing learning resources – that is, to gain the acceptance of teachers to centrally produced materials. Without the teachers' support approaches and materials will often fail.

The Teaching and Learning Technology Programme (TLTP) began in 1992 as a national initiative which initially focused on the development of computer-based learning materials and approaches. The later stages of the programme concentrated on the dissemination of outcomes. The pool of learning materials developed during the programme is available within the HE sector.

To give a specific example, one university has copies of all the TLTP material relevant to their courses. The material is accessed over the university network by being stored on a network server. The university has tried to integrate the learning materials into existing and new courses of study. They have had a reasonable degree of success. However, it takes time to achieve a successful integration, owing to a range of factors. These include:

- the difficulty of persuading teachers/lecturers that the material is suitable
- the fact that the design/content of learning material is largely fixed, so that the existing content must be changed to allow the course to be balanced. Often this requires the order of presentation of content to change (e.g. the conventional course presents A before B while the learning material presents B then C before A).

The Open Learning Foundation is a company limited by guarantee which was established by a group of new universities. It now has 26 members and 12 associated members and seeks to support members to develop learning materials and guide their use of new approaches through sharing expertise. The Foundation has developed a range of open learning materials for subjects including business studies, learning support, health and nursing and management. Materials are developed in response to demand from members but systematic

market research and analysis are undertaken to ensure the viability of the development. The products are mainly text-based. However, audio and video cassettes and computer-based learning may be used to support the text materials. The Foundation in partnership with South Thames College operates a multimedia centre to provide opportunities for tutors and trainers to learn about computer-based learning.

Within HE there is considerable interest in the use of on-line learning and many universities have individual initiatives underway. These include both research projects and using the Internet to deliver courses. In most cases it is relatively small scale compared to the overall work of the university – except in the case of the Open University. Developments range from making workbooks and other learning materials available on the university website to delivering Master's degree programmes through the use of on-line approaches. Within the universities significant computer networking has taken place to allow a more flexible approach to delivering courses. The use of e-mail has grown rapidly until it is now a major method of supporting students. The overall scale of online learning is still modest in comparison with the many hundreds of online initiatives underway in US universities. However, developments in this area are expanding rapidly.

Universities are the source of a great deal of the research evidence which underpins the development of both open learning in general and on-line learning in particular. It is clear that although on-line developments have a large and enthusiastic body of support there is still much to learn about the application and support of on-line learning.

A key role played by HE in support of open learning is the development of multimedia designers. HE probably provides the majority of the learning opportunities to learn about multimedia. A number of universities offer courses at both undergraduate and postgraduate level in multimedia design. In most cases the main focus is not the production of learning materials, but there are a limited number of courses aimed at developing authors of computer-based learning materials. In addition there are a small number of courses (mainly at postgraduate level) centred on distance/open learning using on-line approaches to learn about on-line delivery.

Individual/home

The home market is relatively immature, with sales of material often linked to children's education. However, there is some anecdotal evidence that parents are influenced by their children's use of computer-based learning packs to buy material for their own use. The National Adult Learning Survey (1997) reported that 29 per cent of people had undertaken some form of independent self-taught learning during the previous three years. Twenty five per cent of the group had carried out activities related to keyboard or computing skills. Other popular subjects were those related to a particular trade or profession (26 per cent) and leisure activities (26 per cent). Only a small proportion tried to develop basic skills independently of a programme of study (1 per cent). Fifteen per cent of the respondents had undertaken the learning by following a package of materials (normally paper-based materials) which was supplied to them by their employer, training provider or college. These results indicate the potential size of the adult home market.

There are apparently some niche markets. The growing number of self-employed IT professionals are being targeted by suppliers selling study materials related to improving or updating their skills. The Open University provides a Master's Degree Programme aimed at computer professions, Peritas provides access to packages through the Internet often linked to professional or trade qualifications and a number of other suppliers offer their own or third-party products. Suppliers have indicated that they are mainly supporting learners who are self-

employed to develop advanced-level skills (e.g. Windows NT Security). The cost of advanced IT learning materials is often high with prices in the region of £1,000 for a single module.

In contrast to these products, a range of low-cost CD-ROMs are available through retail suppliers or mail order. The products vary in quality from outstanding to material of very limited value. A great deal of the material is imported from the USA (often excellent but possibly culturally unsuitable) or consists of shareware and old material recycled into a new format. The CD-ROMs cover a range of subjects including management and IT skills. New material is now beginning to become available, mainly aimed at learning about IT applications such as Microsoft Excel.

Libraries are an important source of open learning material for the individual user. A majority (83 per cent) of library authorities in the United Kingdom provide an open learning service. However, this may be misleading in that many authorities have only one or two libraries offering this service. The trend is clearly to the expansion of open learning materials in libraries (see Table 2). The analysis of the loan of open learning titles and subjects shows that computing and typing/keyboard skills are amongst the most popular. Most of the open learning services are free but a third of providers do make a charge for the loan of material and use of the computers (Allred, 1997). Computers are often available as part of the open learning service. However, additional computer and Internet access is being made available in many libraries who do not provide an open learning centre. The trend is clearly towards increasing access to computer and Internet facilities.

Table 2 Proportion of library authorities stocking open learning materials (Allred, 1997)

Year	England (not London)	London	Wales	Scotland
1992	28	22	20	22
1994	71	57	30	26
1996	86	77	94	78

There are other sources of open learning for the individual although few offer the freedom of a public library to simply walk in and use the materials. Other sources include:

- careers services
- telecottages
- community centres
- TECs
- college drop-in centres
- cybercafés.

The availability of public access to the Internet is growing rapidly, with many libraries offering a link. This access is often provided for a fee in the range of £1 to £4 an hour. However, it does not always appear to be associated with open learning in many cases. In several places free access and training is initially offered, but long-term use is on the basis of an hourly charge. Evidence suggests that as soon as charging is introduced the use of the Internet drops considerably. Neilson *et al.* (1998) report that use dropped by 60 per cent to 90 per cent when charging was introduced in public libraries.

The Open University (Morton and Trigg, 1997) have compiled a list of locations which will provide their students with access to computing facilities. The guide explains that students will find a number of different systems in place to access the facilities, ranging from by appointment to a simple drop-in approach. Many of these centres charge either by the hour (e.g. £2 to £7.50 per hour) or by subscription. The guide and other evidence indicates that access is growing. However, to meet the national need far more centres will be needed. The current practice of charging in many locations for using a computer is an effective barrier to many adults who cannot afford to pay.

Training

Some large UK companies have been developing and using computer-based learning materials for most of the last twenty years. Others have a far longer experience of employing paper-based open and distance learning. A NOP survey (1992) reported that 16 per cent of company locations employing more than 11 people used open learning. However, it also revealed a sharp contrast between companies of different sizes. Thirty-four percent of companies employing more than 100 people used open learning compared to only 7 per cent of companies employing less than 10 people. There is a clear relationship between size of company and the use of open learning. The survey was the last of three conducted in the period 1987 to 1992 which showed a consistent growth in the use of these learning methods (e.g. 1987 9 per cent, 1989 10 per cent and 1992 16 per cent).

There are considerable differences between commercial sectors apart from those differences based on the size of organisations. Financial organisations were amongst the first adopters of computer-based training and most banks, building societies and insurance companies are users and developers of open learning materials. In contrast, sectors such as construction make relatively small use of these methods and materials.

The use of open learning materials within companies is frequently based on a resource or learning centre. There are considerable differences between the nature, size and structure of different centres. In some cases a centre could be based on a single computer with a filing cabinet of materials and access to a catalogue of resources. The learner selects a pack which is sent by post from a central resource. In other cases learning centres have scores of workstations and a library of materials immediately available. Some centres are completely open and staff can drop in whenever they are able to use the materials, while others are based on an appointment system. In most organisations the place of learning is not confined to the learning centre. Learners are able to take material to their workplaces and often to their homes. Many organisations are considering the use of intranet delivery of materials to the individual's workplace.

Many large companies are simultaneously buyers of generic open learning materials, developers of products for their own use and commissioners of materials development. Organisations often have internal teams to produce open learning materials including multimedia products. Frequently, these products are never released onto the wider market. However, a group of companies has been developed to support the large organisations that use open learning. These companies tend to specialise in producing bespoke products for their customers. In some cases these are released as generic products. However, the majority of products are probably never released.

The training sector is dominated by large corporate users who are supported by a range of specialist suppliers who are often small or medium-sized enterprises or small parts of larger organisations. This bespoke market is very competitive. However, there is a tradition of

co-operation between suppliers and users which has resulted in the formation of several organisations that facilitate communication within the market.

These include:

- BIMA (British Interactive Multimedia Association)
- BAOL (British Association for Open Learning)
- TACT (The Association of Computer Based Training)
- FORUM (The Forum for Technology Based Training).

In contrast, new users of open learning and in particular those seeking to employ technology in their training delivery often find sources of independent information difficult to locate. Technologies for Training is a service supported by the Department for Education and Employment to provide access to information and advice on technology-based training. The Department for Education and Employment has a long tradition of supporting open learning through facilitating development projects, disseminating information and encouraging the innovative use of technology. However, these activities have steadily declined from its peak during the Open Tech programme.

The most important source of advice to new users of open learning is probably the distributor of learning materials. Many suppliers offer free advice to new customers on how to establish learning centres, provide review copies of learning packages and identify material to meet their customers' needs. Relationships are frequently established between supplier and customer which last many years. Many suppliers of open learning materials are members of the British Association for Open Learning.

Other sources of information are the local college and the Training and Enterprise Councils (TECs). Some TECs have a considerable interest in the use of open learning and have undertaken initiatives to promote its use. This has often been linked to DfEE programmes such as Open Learning Credits but does vary considerably between TECs. Some TECs have given substantial support to the establishment of learning centres and to making access to learning materials easier (e.g. Kent TEC, NorMidTEC, North Nottinghamshire TEC and Coventry and Warwickshire CTEC).

The training of authors of learning materials including multimedia and on-line resources is generally undertaken on HE courses, through on-the-job training and on short courses provided by suppliers. Training is not systematically organised and many authors are initially self-taught. This is a potentially limiting factor to the growth of the market.

Schools

The school market was outside the scope of this project. However, it has some features that have an impact outside primary and secondary education. These are:

- the use of schools as sites of adult learning centres
- suppliers who develop products for schools and other sectors
- approaches which may be transferable to other sectors (e.g. integrated learning systems)
- common needs (e.g. GNVQs)
- the potential of converting material to make it suitable for adults

- similar staff training needs with other sectors (e.g. training teachers to use authoring products)
- influence of schools on individual market (e.g. children on parents)
- research evidence which shows the effectiveness of computer-based approaches which could be transferred to adult learners.

Information flows

The use of open learning in all forms is a relatively new area in which we still have much to discover. However, a key issue is the need to ensure that existing evidence and good practice are made available to practitioners in all sectors of the market. Often practitioners are interested in the same problems and solutions but are separated by jargon, reading different books and journals and by working under different pressures. There are relatively few mechanisms to share information across the whole market and even within sectors. Organisations are often active in disseminating results within their own sector (e.g. CTI, FEDA, Technologies for Training and BAOL), but do not have easy access to information from other sectors.

4

LEARNING MATERIALS

It is difficult to exactly define what constitutes open learning material since it substantially depends on how the material is used and supported. Some writers have chosen to provide examples of open learning rather than attempt to define it. However, there are specific characteristics which open learning material may contain. These include:

- the aims and objectives are clearly stated
- material is provided in meaningful chunks
- material and media are selected to meet learners' needs and characteristics
- learners' choices are maximised to enable them to select what is appropriate to meet their own needs
- opportunities for self-assessment are provided
- opportunities to undertake assignments to develop knowledge, skills and understanding are included.

A wide range of materials and approaches could be called open learning, from a simple book aimed at helping readers develop themselves, to a multimedia CD-ROM. The key issues are how the material is used and what support is provided. Many computer-based training packages are intended to stand alone with minimum support, while some workbooks and other resources are designed to have a tutor available to answer questions by telephone, e-mail or in person. The sophistication of the materials can also differ widely. It is perfectly possible to design an open learning programme based around standard materials such as textbooks and set assignments/tasks which are linked by a study guide. In this case the learning material is not in itself open learning, but the design of the programme turns it into open learning. Equally, a package of materials could be specifically designed to provide an open learning programme. This complexity needs to be understood by tutors, teachers and trainers in order to realise the benefits of open learning and sometimes accounts for different views of the same material.

A wide range of media are used as part of open learning material including paper, audio cassettes, video, computer-based and Web-based learning and multimedia. The overwhelming majority of packs are based on written materials. The National Adult Learning Survey (1997) showed that most open learning material used a range of media but were mainly paper-based (Table 3).

Table 3 Nature of learning materials (National Adult Learning Survey 1997)

Media	Self taught	Part of a taught programme
Written	82	90
Audio	34	20
Video/TV programme	18	23
Computer-based	17	25
CD-ROM	9	6
Internet	4	3
Other types of material	8	8

This analysis reflects the fact that the UK's store of open learning material was developed over the last two decades when computer technology was not always widely available. It is therefore not surprising that it reveals the dominance of paper. The Further Education National Consortium delivers its large resource of paper-based material on CD-ROM, perhaps indicating the trend towards more technologically based delivery. Many publishers and authors have argued that the CD-ROM is an ideal medium for publishing material in that it is difficult to copy, can store a large volume of material and is cheap to mass produce. However, for all technological developments there is a time difference between its becoming technically possible to undertake a task and consumers having access to the technology to make use of it. CD-ROMs are now widely available in all parts of the market. The 1997 Multimedia and CD-ROM directory reported that during 1996 the number of CD-ROM titles increased by 45 per cent with education, training and careers titles being one of the two fastest-growing areas. This illustrates the technological change which is affecting the learning material market. In 1997 the directory contained 19,000 titles covering all topics and subjects. The majority were not intended for direct education and training use.

A search of learning materials available for Internet delivery shows a number of examples combined with a considerable interest in developing materials and courses in most sectors of the market. The material that is available tends to be text-based products which learners would normally print out in order to study. This again reflects the time required to develop products in a new environment. The BASE survey (1997) of multimedia developers indicated that the majority currently offered some form of on-line service. This was mostly limited to the provision of marketing information, technical assistance and customer communications. However, a number provided some form of electronic sales service or subscription service. Within FE and HE there is a growing trend towards using the Internet either as a general library of resources or to deliver on-line learning.

There is no one list of all available open learning materials in Great Britain. However, there are a number of partial lists including:

- the Open Learning Directory (ceased publication in 1997)
- the OFL-CD
- The Multimedia and CD-ROM Directory
- Technology for Training (multimedia database under construction)
- CAA (Computer Assisted Assessment) CD-ROM
- Gower Open Learning Directory (CD-ROM)
- CTI centres lists
- many commercial directories (including some on-line lists such as those from the Virtual Training Library and McMillan Partnership Ltd)

It is difficult to estimate the volume of open learning material available owing to a number of factors, not least the problem of defining what open learning is. In some subjects (i.e. information and communication technologies) there is a tendency to use similar titles so that it is difficult to identify different packages. This leads to a good deal of double counting or missing materials with similar names. The BASE (1997) multimedia survey identified 10,001 titles. This is probably an overestimate, since it was based on catalogues of material available from commercial suppliers and contains duplication. Technologies for Training (Guildford Education Services Ltd, 1997) are developing a database of multimedia materials and estimate that there are approximately 5,000 titles. The Open Learning Directory (which is recognised as a good source of information on paper-based open learning materials) lists over 2,500 titles. The OFL-CD contains over 10000 titles. However, there is clearly some

duplication of titles in different sections. It is likely that if we take a broad view of open learning there are probably 20,000 to 25,000 packages of which 5,000 are computer-based products. There are also specialist applications such as those designed to aid assessment and the computer-assisted assessment database lists 117 English language products produced by 47 different developers.

The coverage of subjects is clearly skewed, certain subjects attracting many packages while other areas being largely ignored. This appears to be related to the wider education and training market. There are many titles relating to management/business training, information technology and foreign languages. These subjects have either a consistent demand (e.g. languages) or a market willing to pay a high price for quality products (e.g. management training) or both (e.g. information technology). In other subjects there are far fewer titles and anecdotal evidence suggests that there is a very limited range of materials available in community languages (such as Punjabi) or basic skills or designed to be locally adapted.

Librarians (Allred, 1997) reported a number of subject areas where they have found it difficult to obtain stocks of material. These include:

- basic skills
- material in Asian, Welsh and Greek languages
- photography
- countryside skills
- interior design
- leisure skills
- childcare
- nursery nursing.

A survey (NEC, 1997) of the use of open and distance learning in FE colleges showed that a wide range of subjects were taught using these methods (e.g. astronomy to Christian theology). However, colleges often specialised in a particular subject so that the availability of the courses was low. It appears that several colleges have found niche markets for particular open and distance courses (e.g. electronics).

The popular subjects (offered by more than one college) were:

- IT/computing
- English
- mathematics
- engineering
- accountancy.

5 COMMERCIAL SUPPLIERS

There is a well-established group of open learning suppliers in Great Britain. They tend to specialise to some extent in particular sectors of the market or in supplying certain types of service. The services include:

- distribution of third party products
- bespoke development of learning materials
- consultancy
- demonstration centres
- identification of materials
- publishing of materials.

Suppliers of all types of open learning material tend to be small. The BASE survey of multimedia companies (1997) reported that 66 per cent of the companies who responded employed 10 or less people and only 7.5 per cent employed more than 50. An earlier survey of open learning providers in general (DfEE, 1992) reported 25 per cent had 5 or fewer employees and a further 30 per cent had less than 15 employees.

The British Interactive Multimedia Association lists 107 commercial members, 31 organisational members and 53 individual members. Thirty-seven BIMA members are identified as offering training services, 29 as being training/education organisations, 19 as involved with interactive learning and 12 as linked with education programs (BIMA, 1998). Some organisations are listed under several headings.

There are over 40 suppliers of information technology learning materials. However, there are leading suppliers who can provide access to hundreds of titles or who combine IT materials with conventional training courses, including NETG, CBT Systems, Peritas, Oracle and Learning Tree. These organisations operate in several sectors of the market.

There are also over 40 suppliers of basic skills materials if we consider a very broad definition of the category. However, most suppliers have only one or two titles to offer, with the exception of the National Extension College which offers a range of titles.

British products are exported to the English-speaking world and versioned for use in the European Union. In return, the market imports a range of materials from the USA, EU and Australia. The anecdotal evidence suggests that most imported material is related to IT skills or management subjects.

The BASE (1997) survey of multimedia developers asked respondents to rank in order of importance the different parts of the market (Table 4). This shows the importance of large organisations and education to multimedia developers. The considerable investment required to produce a multimedia title is a major influence on the choice of market. Large corporate organisations have the resources to commission bespoke products or purchase generic materials at a high price. Education has a large number of potential buyers so it is possible to sell many copies of a title. In both cases the investment risk is reduced.

Table 4 BASE 1997 survey of markets

Sector	Percentage Ranking
Large organisations	37.7
Secondary Education	24.5
Tertiary Education	20.8
Training bodies	13.2
Employed individuals at home	13.2
Unemployed individuals at home	13.2
Professionals	11.3
Vocational Education	9.4
Small and medium enterprises	1.9

Open Learning publishers can be divided into four groups:

- the large publishing houses for whom open learning is a sub-market
- the large specialist providers
- the smaller specialists who have a limited open market lists but work at least as much on bespoke open learning for corporate clients
- CBL producers including multimedia products (their materials include workbooks and other media).

This image of producers has remained constant for several years, but recently there were a number of take-overs in the publisher group with larger corporations taking over smaller organisations. This has produced some large organisations in this traditional small company market (e.g. Financial Times Management is a combine including Open College (OC), Henley DL, Pitman OL and Training Direct).

A number of small producers have also entered the market with new material. Estimates suggest that the material being currently produced is a balance of computer-based and paper-based products.

The commercial suppliers are supported by a large number (hundreds) of self-employed individuals who provide a range of services for the larger companies and corporate organisations that produce material. These individuals provide design, editing, technical and research skills. Equally important is the role played by FE and HE. Colleges and universities are often partners with commercial producers in developing products. This partnership takes many forms but perhaps most commonly arises where the college provides subject and environment expertise while the commercial partner offers technical and marketing skills. There is a number of consortia of colleges which are developing learning materials, often as part of an EU-funded project. The other important connection is that FE and HE provide the staff of commercial companies with many of their learning opportunities to develop wider skills.

6

BASIC SKILLS MATERIALS

The availability of high-quality professionally produced open learning materials is very limited. The OFL-CD (1997), a database of open, flexible and resource-based learning, lists only 54 titles while the Open Learning Directory identifies 26 packs on basic skills in 1995 and 27 in 1997. In the latter year these broke down into 12 packs on aspects of literacy, 13 on numeracy and 2 which covered both. The literacy packs mainly concentrated on specific areas such as spelling, grammar and letter writing, although some covered a wider range. The Multimedia and CD-ROM Directory (18th Edition) lists 24 adult literacy titles and 423 mathematics tiles. However, the vast majority of the mathematical products are clearly not aimed at basic skills development. Many of these adult literacy and mathematical titles were developed for use outside Great Britain. The Interactive Directory of Learning Resources lists 15 literacy and 10 numeracy titles which are mainly duplicated by the titles listed within the OFL-CD database. Librarians (Allred, 1997) frequently report difficulties in finding basic skills open learning learning materials.

There is a small number of commercial producers of basic skills open learning materials in this country (e.g. CTAD, Ivy, Maxim and National Extension College). National Extension College titles were frequently seen or referred to during many of the investigators' visits to learning centres. There is probably a larger group of producers of resource-based products (e.g. worksheets and books) which are designed to be used as part of a tutor-led programme. Many of these producers appear to be small organisations or publishers who are aiming their products at both the adult basic skills market and secondary schools.

The materials are often paper-based although some multimedia products are available which are highly regarded by basic skills tutors (e.g. the Reading Disk, CTAD). Several tutors and learning centre staff commented that their budgets were very limited, so that products costing more than £50 were seldom purchased – which tended to exclude computer-based learning materials. The other issue raised by tutors was that computer-based learning was often not sufficiently flexible to meet the precise needs of individual learners, although their experience of this type of product was often limited. Some products tended to be designed to provide an entire course of study while learners only required certain elements of the material. Tutors desire to use materials which are flexible, adaptable and modular. Most basic skills centres have a large volume of material which their own staff have written, often in the form of worksheets. These are often employed to produce an individualised learning programme.

There is considerable evidence which suggests that computers can make a significant contribution to the development of basic skills. Over the last two decades evidence considering the use of word processing, spreadsheets, spell checkers and grammar checkers in supporting learners to develop basic skills has regularly been published. A great deal of this research has been based on children. However, there is no doubt that word processors, spreadsheets and other applications can be powerful aids for adult learners. The Basic Skills Agency published a guide to software which listed word processors, spreadsheets and databases that could be used in basic skills. Several word processors have been specifically designed for educational purposes (e.g. PenDown) and although these are primarily aimed at schools, they clearly could have a role with adult learners. Software (Predictive Adaptive Lexicon, PAL) has been developed to assist users who are physically disabled to use keyboards by reducing the

number of keystrokes they have to make by predicting the word that is being entered. This type of product can be used to support the development of literacy skills. Speech recognition systems have been used for some years but recent advances in this technology area combined with significant price reductions have made then far more accessible (McKeowan, 1997). These types of products illustrate the potential of information and communication technologies to aid the development of basic skills.

Semerc is a specialist distributor of IT resources for special needs. Their catalogue lists a range of computer based products which could have a role in adult basic skills acquisition. The majority are aimed at children within a school environment. However, many could be used with adults or show the potential of similar products for adult learners. The catalogue lists 55 literacy and 18 numeracy products. The majority are clearly designed for children and are unsuitable for adults without adaptation but they do demonstrate the power of computers to contribute to basic skills.

There is thus a wide range of computer-based software which can be used to assist with basic skills development. During this project it was not apparent that this potential was being realised. Computers were observed to be peripheral to basic skills programmes and were mainly used to develop IT skills. It was also apparent that some basic skills tutors lacked confidence in their own ICT skills and understanding of how to use computers to develop basic skills. In contrast, basic skills publications frequently contain articles discussing the use of ICT while anecdotal evidence suggests that computers have been successfully integrated into basic skills programmes so that these impressions may not be correct.

Integrated Learning Systems (ILS) are computer-based systems which manage the delivery of learning materials to students. Students are provided with individual programmes of study lasting weeks or months (NCET). Several Integrated Learning Systems are available from British and US suppliers and have been piloted in a number of schools. The piloted systems have been designed for children (e.g. SuccessMaker, Global and Jostens). However, at least one ILS designed for adult learners is available in Great Britain (PLATO). The learning material is often related to developing English and mathematics knowledge and skills. Evaluations have been undertaken in schools (NCET, 1996; BECTA, 1998) which have provided evidence of the effectiveness of this type of product. The results of the evaluation clearly relate to the particular ILS being considered and how it was used. However, it does show the potential of this type of product to:

- motivate learners (including students previously under-achieving)
- contribute to learning English and mathematics
- offer a stimulating way of providing learning opportunities
- provide detailed diagnostic information for teachers
- achieve improved reading and numeracy in certain cases
- help students who are learning English as a second language
- develop teachers' confidence in the use of ICT.

The evaluation did stress the importance of both time spent on the system and good quality teacher involvement with the ILS. Although there are a number of provisos in the evaluation, the evidence shows the potential of ILSs to support the development of English and mathematics. An important issue identified by the evaluators was that integrating an ILS into an existing organisation was not easy and could take several years.

Many of the basic skills tutors who were interviewed during this project had doubts about the suitability of open learning as an appropriate approach for basic skills. They saw this as a

major reason why open learning materials were not available. They pointed out that the underlying literacy and study skills required to use open learning materials made them unsuitable for many learners. Such materials often provided a whole course of study while basic skills students frequently had problems in distinct areas so that only small parts of the material was suitable. The approach to locally prepared materials is based on the production of a large number of items so that individual learners may concentrate on particular topics. The analogy often used was that learners lacked key bricks in their wall of understanding and the materials needed to provide the individual bricks, not the wall.

Most tutors preferred resource-based materials which they could adapt to their local needs and circumstances. Many producers have certainly identified this preference and provide resources rather than an open learning approach. The evidence that open learning is unsuitable is not proved and given the scope and variation of basic skills students it is unlikely to be so. However, the need for individual support is essential for a majority of the students.

7 INFORMATION TECHNOLOGY MATERIALS

In contrast to the limited range of professional basic skills titles there are a large number of titles aimed at developing IT knowledge and skills. The CD-OFL (1997) lists over a thousand titles and the Interactive Directory of Learning Resources (1998) lists 808 titles, while other sources suggest that in excess of 2,000 titles may be available. The packages largely provide computer-based learning and tend to focus on developing the learner's skill to use a particular software application (e.g. Microsoft Word 6). This is illustrated by the 808 titles listed in the Interactive Directory of Learning Resources which includes 575 relating to software applications supplied by Lotus and Microsoft. There is a clear relationship between the popularity of a software application and the availability of learning material related to it. Microsoft Word 6 is a very widely used application and a number of producers have titles available to support learners who want to use it. In contrast, Microsoft Word 7 learning materials are far scarcer, reflecting the more limited use of this version of Word.

Learning materials range from tutorials relating to office applications to advanced topics such as network security and programming languages. The cost of the material is often high with advanced IT topics on sale at up to £1,000 for each CD-ROM. Purchasers of IT skills learning material generally have an extensive choice of producers and suppliers. The one area which is not well served appears to be basic IT skills for the new computer user. Few packages seem to address the needs of the first-time user. The producers appear to target computer literate users rather than beginners, the exception being producers of keyboard or typing skills. However, even here some packages are not seen as suitable by learning centre support staff. Support staff often use a range of keyboard packages to allow new users to gradually develop their skills. Both the government's IT for ALL programme and the BBC's campaign Computers Don't Bite have found it necessary to produce multimedia CD-ROMs to address the initial learning needs of first-time users.

On-line distribution of computer-based training is a recent development, although some organisations have been active for several years. There is an increase in companies offering some form of Internet delivery and many more appear to have plans to move in this direction. Wave's On-line University has been recently launched and offers on-line assessment, access to learning materials, counselling support, virtual classes and tracking of student activities. KnowledgePool and NETg are offering a worldwide service which allows users to download multimedia modules and provides a 24-hour personal mentor to support them. Other on-line services are offered by Oracle, BT and CBT Systems. In addition to these commercial ventures, several universities are developing on-line services to support IT courses. The largest is probably the Open University which is expanding its range of IT modules available on-line (although in most cases learning material is sent conventionally to students and the on-line dimension is for support and assessment). Equally, interest in on-line learning in colleges is high and there has been a major growth in the development of intranets and other network distribution services. Several colleges offer distance learning IT courses although these are mainly focused on basic or first courses.

Many larger companies are experimenting with the delivery of training using intranets. However, there is considerable doubt about the effectiveness of delivering learning directly to the workplace. This is based on a consideration of the nature of the workplace: it is often a busy, noisy and stressful environment which is probably not suitable for learning. A preferred model

is to provide a learning centre or study area where employees can access the intranet resources in an environment designed to assist learning. A number of university and college websites offer downloadable IT learning materials, usually in the form of text-based tutorial or workbooks. These are often provided free of charge.

The design of IT learning materials is frequently based on a simulation of the application being learnt or on the use of the actual application with the tutorial appearing in parallel. This approach is highly effective but does tend to make materials appear similar. Several producers have developed a standard framework or template for their materials which provides them with the ability to produce new products quickly and cost-effectively. This is critically important given the fast rate of change of the whole IT market with the regular releases of new versions of applications.

In addition to the large volume of computer-based open learning materials there is a significant volume of books designed to help individuals learn to use an application. Many of these books employ a type of open learning design and are structured to aid systematic learning. The cost of books is generally less than the equivalent open learning pack. However, the price ranges do overlap.

Another significant source of learning is the application itself. Many applications now include training material. The quality of the material is variable and is sometimes little more than a book on a disk.

8

ON-LINE LEARNING

There are a number of approaches to supporting learning by the use of computer and communication technologies. The main ones are:

- the simple delivery of the learning materials to the learner (i.e. the learner downloads the package and either works interactively with it on their own computer or prints out the material and takes the paper away with them)
- placing lecture notes and visual aids on the web, Intranet or network to aid students
- using the WWW as a library of resources (e.g. electronic journals, online databases, reports and references)
- providing communication links between student and tutor (i.e. supporting learning)
- providing communication links between learners to allow mutual support (e.g. conferences, mailgroups and bulletin boards)
- providing communication links between tutors
- providing lists of 'frequently asked questions' on websites
- offering interactive learning on-line (i.e. the learner works with a package at a remote location)
- providing computer learning environments (e.g. microworlds)
- offering computer-assisted assessment
- offering virtual seminars and conferences
- using video conferencing to provide face-to-face support to learners in remote locations.

The interest in all forms of on-line learning is huge and hundreds of different developments are underway in Great Britain. However, the proportion of learning delivered on-line is still relatively small. Within HE and FE the use of e-mail to link student and tutor is already well established but normally in the context of a conventional classroom or open learning course. Equally, the growth of conferencing and mail group facilities is significant so that many thousands of students have now the means to discuss issues with their peers and tutors. The Open University has provided conferencing and e-mail services for several years and tens of thousands of students have taken part. Some of this communication is essentially enhancing the informal learning which in a conventional sense would take place in corridors, canteens and through face-to-face student interaction.

More structured uses of communication links are being developed so that e-mail and conferencing are being integrated into course programmes. However, progress is slower than the explosive growth in the use of e-mail. The Open University has begun to version existing modules to allow students to submit and receive feedback of assignments on-line. This involves tutors changing their approach to supporting learners (e.g. marking assignments on the screen to provide faster feedback). The Open University already has thousands of students sending their assignments and receiving feedback by e-mail. Within other institutions the scale is often smaller but many significant developments are underway. Several universities

and colleges have developed courses based on the use of communication technology (e.g. Sheffield University, Sheffield College, Manchester Metropolitan University, Oxford University and London University).

Methods such as virtual seminars and conferences are being used but are still relatively rare. The evidence suggests that they can be effective approaches. However, they are significantly different from their conventional analogies. On-line seminars often last many weeks or months and involve participants from many parts of the world. This removing of national borders for the delivery of learning is likely to be a major effect of on-line delivery of courses. At the moment only a small number of virtual seminars and conferences have been held and few evaluations have taken place. It is clear that practitioners are experimenting with the approaches and good practice is only just beginning to emerge.

Many HE and FE institutions are making learning materials available to students and others by placing them on Internet and intranet sites. In the main these are paper-based workbooks or guides which users download and print. These are often linked to important generic topics such as IT skills, Using the library and Study Skills. In some cases taster materials have been located on websites for prospective students to try out.

It is probable that most HE and FE institutions are implementing or considering how to use the Internet to support their work. The large number of developments makes it difficult to analyse. The types of development frequently encountered are:

- paper-based learning materials available on a website for downloading
- Web-based assessment
- course information
- taster packs
- conferencing for courses
- mail groups for courses
- access to library catalogues
- links to websites containing useful resources.

The development of virtual environments is also taking place but they are not widely available.

Commercial training materials developers are beginning to use the Internet to distribute their products, or offer some form of after sales support or market their materials. This seems to be mainly based on allowing prospective customers to view review copies of the materials and following purchase to download the material. In a parallel development large corporate users of multimedia and computer-based learning are carrying out a similar process based on their intranets.

Evaluation and research evidence to support different approaches is not overwhelmingly available. There is little to help tutors or institutions compare approaches or identify effective practice. This is perhaps not surprising given the speed of development and the pace of change in this area. However, it is vital for the exploitation of on-line methods to have access to the emerging evidence of good practice. For example, distance learners have frequently been supported through telephone contacts; how will switching to e-mail support affect their learning? The anecdotal evidence suggests a number of changes:

- more e-mails from students than telephone calls
- e-mails are less intrusive than the telephone
- e-mails are shorter and more focused
- it is more difficult to diagnose problems by e-mail
- the tutor can support more students by e-mail
- e-mail does not replace the need for occasional telephone discussions or face-to-face meetings.

9 INFORMATION TECHNOLOGY AND TUTORS

The impact on a teacher, tutor or trainer of introducing ICT to their teaching methods is significant and should not be underestimated. Most tutors who have begun to use ICT approaches have been volunteers and to some extent enthusiasts for incorporating new technology into their teaching and learning support. Future development in all sectors requires far more tutors than can simply be supplied from the ranks of the enthusiastic volunteers. Teachers, tutors and trainers have to be persuaded to change their methods and take part in the re-training they need to successfully employ ICT.

Talisman (Tomes and Higgison, 1998) is a project based in Scottish higher education investigating the training needs of teachers who were mainly (80 per cent) confident computer users, reported that a majority (54 per cent) still indicated basic training needs in relation to computers and networks. Existing users of network-based learning technology also indicated that they need training in evaluating third party materials and in authoring skills. This shows that training is not a simple matter of an introduction to the subject but will require an extensive long term effort.

The training will depend on how ICT is going to be used. The first step is certainly to develop confident users of ICT. However, this needs to be followed by specific training to help tutors use ICT to deliver and support learning. It is not obvious how to use ICT with learners. We now have 20 years' experience which should be made available to new users. They will be in danger of repeating old mistakes and re-inventing wheels unless they receive high-quality training.

There are relatively few ways of being trained to become a designer or author of computer-based learning materials. The largest number of courses of study are provided by HE at undergraduate and postgraduate level. However, most of these courses are not directly aimed at the development of learning materials but at multimedia in general and are mostly offered on a full-time basis. Apart from HE there are limited opportunities, except for in-house training within the commercial multimedia companies and corporate users of multimedia. Distributors of authoring products often provide specific short courses on their systems but more general training is not widely available. The GNVQ in multimedia has begun to become more widely available but does not appear to have had a large impact on the production of multimedia learning packages. This may change as more organisations become aware of the qualification.

Learning how to employ on-line approaches is also largely a feature of HE, although FE colleges have certainly begun to provide opportunities (Sheffield College). There are several Master's programmes available for practitioners who want to extend their knowledge and skills in on-line learning. A partnership of the Open and London Universities has been offering a course in computer-mediated communication for several years.

Within FE, the QUILT programme being provided by FEDA is disseminating good practice and raising awareness of the use of computer-based learning amongst FE staff.

In general, even with a modest increase in the demand for tutors and trainers to develop computer-based learning or use on-line approaches, it is doubtful whether existing provision could meet the training need.

10

QUALIFICATIONS

A large amount of open learning material is related to the achievement of a qualification (NEC, 1997). Although the majority of materials are not intended to directly relate to a particular qualification. The DfEE's Matching Programme began in 1988 and was aimed at analysing open learning materials to:

- highlight gaps and inadequacies on open learning provision for NVQs
- enable learners and learning providers to plan open learning routes to NVQs and other competence based outcomes.

The programme reviewed a large number of packs of material but never covered the whole market since it was mainly concerned with material which addressed, or appeared likely to address, selected occupational standards. The results of the matching analysis were published in the form of a series of databases until by 1995/96 50 were available. The assessment was made only on the basis of the relevance of the materials to one or more sets of standards and was in no way a comment on the overall quality of the material. In fact some of the material included was of only moderate quality while much very high quality material was excluded because it did not address any of the standards under review.

The choice of occupational areas was driven by the readiness or otherwise of occupational standards. For much of the programme's duration the initial standards development programme was in progress and the choice of fully approved standards was limited. In the later stages when more standards were available the selection was made largely on the basis of number of potential users, coherence with existing databases, and known or estimated volumes of available material.

The final list of sectors covered and the approximate number of analysed packs in some of them is given overleaf in Table 5.

Of the packs reviewed and entered in each database, very few scored highly on relevance to more than a small section of any given set of standards. Only those which had been designed to address an NVQ scored highly across all or most of a standard, and even some of these did not score as well as might have been expected.

The matching programme ended in 1995/96. Since 1995/96 more material has been developed to address NVQs but the overall situation is that there are relatively few open learning packs which concentrate on the achievement of NVQs. There is a larger number which can make a partial contribution or assist in a general way but specific material is not widely available.

The Government has made a substantial investment in NVQs and occupational standards, has set targets for itself and others in 'NVQ or equivalent' terms, and has set up a funding system through TECs which relates to NVQ outcomes. The Matching Programme was designed to discover how well open learning material addressed the requirements of occupational standards and the finding, in many cases, was not well at all. There were three main problems:-

Table 5 Matching programme databases

Database	Packs
Administrative Business and Commercial (level 1/2)	245
Agriculture	34
Management	323
Health and Social Care	27
Child Care	6
Ambulance Service	3
Accounting Technicians (2-4)	4
Secretarial (level 3)	73
Hairdressing (13)	7
Bus and Coach – Vehicle engineering (1-3)	35
PSV driving (level 2)	6
Pensions Administration (all levels)	8
TDLB (inc OL)	79
Retail and wholesale (levels 1-4)	60
Retail Dairy	3
Meat industry	335
Forestry Fish and Game (level 2)	23
Journalism (newspapers and periodicals)	16
Hotel and Catering (levels 3/4) Food Preparation and Service and Beverage Service	11
Reception and Accommodation	12
Sales	
Sea fishing (all levels, catching, processing, mongering and frying as separate databases)	
Construction (all levels)	85
Water Services	
M & ETA	
Food industry (except milling and sugar)	
Sport and Recreation	
Chemical industry	44
Financial services	
Wholesale industry and retail industry at all levels	
IT	
Supervision	
Language standards for English, French, German, Spanish	
Environment	
Motor trade	
International trade	

(Working copies of the other databases could not be located but none of them contained very large amounts of material.)

- Many packs addressed some of the standards but dealt only with some of the performance criteria. This is hardly surprising, since most of the materials were written before the standards were developed, but it does not make it easy to assemble a coherent NVQ learning programme by open learning. The only materials which dealt with a complete NVQ were those which had been specifically written for that purpose.
- Some sectors with small or unproved numbers of potential learners had almost no open learning of any description.
- To cover a whole set of standards or a whole NVQ requires a substantial body of material and represents a considerable investment for the producer. Although most standards have now stabilised to a reasonable extent the 4–5 year reapproval period still means that producers of NVQ-related products need to be fairly certain of recovering their investment within that time. The amount of purpose made NVQ material has grown substantially in the last four years but it remains mainly confined to high volume areas with a good chance of a return on investment.

Open Learning should in principle be able to help learners achieve competence by specifically linking theory to practice and encouraging the learner to apply what they have read to their own work (Walmsley, 1997). There are now more materials which attempt to make this connection.

The standard approach to develop competence essentially offers a 'unit' of learning material for each unit of the standards. The logic of this is obvious and it meets not only the economic point of being easier to revise if one or more units of the standards changes but also the expectations of the purchasers and learners. However, it is not always the best way of approaching learning. Many tasks which people perform regularly cut across two or more units, and most adults will in reality learn a job by relating to the work they do rather than to the units of standards. This is not to say that the current materials are unsuccessful in delivering the NVQ learning.

A great many of the NVQ materials are intended to be purchased either by companies for in-house use or by training providers offering NVQ programmes, often in the National Traineeship/Modern Apprenticeship systems. In these conditions materials are usually supported in varying degrees by trainers who may, indeed, only use certain sections of the packs according to the requirements of their trainees. Assessment for the NVQ is therefore part of the programme and does not need to be separately negotiated. Any UfI-generated demand for such material by individuals would create a different situation which has so far not been experienced.

11

PRICES

The pricing structure of Open Learning products are complicated by a number of factors. These include:

- single-user licensing
- site licensing (e.g. unlimited use of product at a single location)
- educational discounts
- subscription services
- single-user workbooks
- free photocopying (e.g. a single copy is bought with a licence to photocopy at no additional charge providing certain conditions are satisfied).

Licences are inflexible devices which many users of open learning material feel do not take account of their way of working. Libraries want to allow users to borrow material to use at home. Many providers will only offer a licence which essentially limits the product to 'reference only': the material cannot leave the library. Adult education practitioners often comment that licences fail to take into account the multiple site nature of their operation with relatively few learners at each site. Material producers treat adult education as if each site were a college with thousands of students and charge accordingly. The example shown in Table 6 illustrates the price variation with different types of licences and customers.

Table 6 Software authoring tool – education, corporate and licensing

Price	Education	Corporate (ex. VAT)
Single User	£25.49	£99
10 Users	£217.02	£895
25 Users	£506.38	£1,895
50 Users	£957.44	£2,995
100 Users	£1,774.47	£5,495
Site licence	£4,255.32	£20,739.68

These factors (although complicating the prices of products) appear to be logical. However, many purchasers complain that in practice it appears to be more about what is the maximum price the market will bear and that licensing conditions regularly change. Equally important is whether the centre is classed by the supplier as an educational or corporate site. Companies opening up their facilities to the local community may face difficulties about pricing. Small companies often have to pay significantly more for learning materials than a college with a turnover of many millions of pounds under this system.

The cost of developing open learning materials is high: it represents a significant investment for the developer and publisher and explains their desire to protect their products through licences. The cost of developing materials depends on the selected media and the European Commission (IRDAC, 1994) estimated the cost of producing one hour of materials in different media (Table 7).

Table 7 Development time for different media (IRDAC, 1994 and Hunt and Clarke, 1997)

Media	Hours
Traditional classroom face-to-face	10 to 20
Teleconference	20 to 100
Paper-based materials	20 to 200
Video	200 to 1000
Computer-based training	200 to 1000
Multimedia	500 to 2000

Computer-based learning and multimedia products are often expensive, reflecting the high cost of development and relatively small numbers of sales. However, the growth in the market and in the demand for these materials indicates that prices will fall and there are examples of products which are selling at similar prices to paper-based packages.

12

QUALITY

The quality of Open Learning is complex and includes a range of factors:

- The actual physical quality of products (for example: can the user easily load the software?).
- the learning design of the materials (are they effective?)
- the level and competence of support for the learners. (This can be critical even with the best materials)
- the quality of the surrounding service (e.g. the administration, record keeping, advice and guidance)
- the impact of learner expectations and the role of the learner in the learning process
- the requirements and influence of other parties to the contract (e.g. those of employers and funding bodies, which may be at variance with the aspirations of the individual learners and can have a considerable impact on outcomes, irrespective of other aspects of quality).

Quality is not simply about the physical learning materials. During this project many pieces of anecdotal evidence indicated that high quality materials were no guarantee of success. The whole learning process needs to be considered. The motivation of the learners or excellent peer support or both can overcome poor materials. Quality needs to relate to the whole service offered to the learner and not simply the learning materials.

The physical quality of material may be more important in computer-based learning (CBL) material than in more conventional products. Good text printed on poor quality paper and comb-bound may not impress and inspire but at least it does not actually hinder learning. Badly designed CBL can defeat its own objectives. It would be comparatively easy to lay down certain basic physical standards for open learning, but would the cost justify the result in terms of the learning experience? Some CBL material is little more than textbook content scanned onto a disk (DfEE, 1998b) and does not in any way meet the requirements for high-quality learning material. It would be more difficult to define a standard for CBL but it may serve the purpose of removing this 'book on a disk' product. However, the standard would need to be general and not linked to particular technological approaches and equipment since these will inevitably change. However, research evidence may not always be available in all aspects of physical design (Clarke, 1997).

Good learning design depends on a number of factors including a proper examination of the needs and preferences of the target audience, good analysis of the subject matter in order to present it helpfully and the use of plain language. There is no single set of rules for learning design because the objectives of the exercise may vary widely. Several researchers have suggested guidelines and approaches (Patrick *et al*, 1986; Riding, 1993). The effectiveness of material in enabling learning can only really be tested by evaluation.

Learner and third-party expectations are important in determining quality in open learning because quality, like beauty, is to some extent in the eye of the beholder. If the learning programme forces learners to cover substantial areas which they already know, their perception

of the quality of the learning experience will be affected, just as it will if there are areas of knowledge missing from the materials. If the employer, in funding the learning, expects all the learners to complete in a certain time and they do not do so, the employer will be disappointed and perhaps disillusioned about open learning even if the original expectations were unrealistic. John Coffey, then principle of Wolsey Hall, Oxford, presented a conference paper entitled 'Contracting for Quality in Learning' in which he suggested that the approach to this issue should be through the clarity and completeness of the contract between all parties to the learning undertaking. This paper became one of the foundations of the Code of Practice for European Distance Learning developed by the SATURN organisation in the early 1990s. The principle here is that because people inevitably judge the less tangible aspects of quality by 'what it was like for them' it is important that all their expectations are clarified at the outset and any unrealistic aspirations dealt with before the process begins.

One of the basic principles of open learning is the availability of support for the learner. Many learners make little use of such support and, in an open and learner led system this will be perfectly acceptable provided that progress is being made. Others however will never complete even the most basic programme without support for many reasons. In a DfEE-funded study of the effectiveness of open learning (Calder, 1995) it was clear that over 40 per cent of the learners using open learning felt that they learned better from a teacher than from books. In the same study 24 per cent of open learning users said they liked learning in groups. In her evaluation of the individual learners' experience of learning in the Open Tech programme Rosemary Welchman (1989) found that many of the difficulties reported by learners related to a lack of (or unsuitable) support.

The British Association of Open Learning (BAOL) has produced a standard, the 'Quality Mark', based on the business excellence model which provides a system with a number of strengths. These include covering the whole learning experience, designing for different environments (e.g. colleges, employers centres and private providers) and modularising to fit different types of provision. The BAOL Quality Mark provides a quality assurance system based on internal self-assessment and external verification for those organisations who offer open learning products and services. It is intended to be relevant to all aspects of open learning provision and use. There are four categories:

- materials development
- advice and guidance
- learner support
- learning centres.

This type of quality standard is likely to be more suitable for open learning since it judges the whole learning process rather than a single aspect (i.e. the quality of the material).

13

STANDARDS

The use of computer-based learning is often limited by the lack of standards which would allow products produced by different developers to be combined into one overall system. This is especially important when providers are seeking to employ a management system to track student progress and to assist them to control and organise their learning. At the moment it is more by accident that two or more products can be integrated together; it is more likely that different systems are not compatible. This lack of standards is hindering the development of a worldwide learning market. It is also a considerable frustration for purchasers of computer-based learning that their plans are often limited by a lack of compatibility.

The Instructional Management System (IMS) project is seeking to produce standards for inter-operability between computer-based learning materials and management systems. The Open University and the University of Wales at Bangor have established a centre to link the US IMS project with higher education. The project aims to produce standards to describe learning materials and allow for different systems to work together.

The acceptance of standards for learning materials and systems could be very important development since it will aid the development of the learning market by removing barriers and maximising returns on investment.

14

SUPPORT

It is very difficult to design learning materials which are completely independent of human assistance. Research into the application of artificial intelligence techniques has illustrated the practical problems of designing learning packages which are able to emulate some of the skills of a teacher or mentor. There are many reports (Tavistock, 1987; Coopers & Lybrand, 1989) which emphasise the importance of supporting the open learner. Failure to complete a course of study or requiring excessive time are common problems of open learning. Appropriate human support is important to reduce these problems. Without support many learners will fail.

Learners encounter a wide range of problems and difficulties before and whilst undertaking an open learning course. These are often related to:

- which package or course to choose
- work problems (e.g. ICT professionals often are required to work long and unsociable hours, which makes studying difficult)
- interpretation problems (e.g.'I do not understand what this means')
- personal doubts (e.g. 'I was never any good at maths').

Support can take many forms and it is not always necessary to provide immediate face-to-face subject-specific help. Learning centres have demonstrated that a trained generalist who understands learning can provide significant assistance. The availability of expert subject support is required only occasionally and can be provided by e-mail or telephone access or the occasional tutorial. Students can help each other and forming a self-help group is a powerful aid to the individual student in overcoming problems. Learners find it far easier to approach each other with questions than to contact an expert whom (in an open learning programme) they may not have met. Most students need a balance of general and individual help. They need access to:

- advice and guidance
- general support
- peer support
- subject support.

A number of organisations have sought to provide some of these functions by developing websites with communication facilities for learners to discuss issues and ask questions of each other, seek general support or subject-specific help. Privacy can be provided when needed and the responses to all questions displayed so that learners can benefit from each other's concerns. This type of approach is likely to benefit learners who are widely dispersed or unable to visit a physical learning centre, and is quickly developing. It clearly has the potential to make a valuable contribution. However, relatively few organisations have extensive experience of these methods, and often conventional support is also provided so that on-line support is an addition rather than a replacement.

The key is that no matter how outstanding the design of the learning material some human support is needed. The quality of open learning is not simply about the materials; it is about how they are used and supported.

A mass market of individuals who are studying using open learning needs to be properly supported or there could soon be many failed and disenchanted learners. Supporting open learners requires skills and attitudes other than those of face to face teaching. There is a national stock of competent open learning tutors. However, it would be a mistake to think that the open learning industry could absorb and support substantial numbers of new clients without a major expansion of its tutor base.

In addition to these general concerns, supporting ICT-based learners requires technical skills and these are in short supply simply because the technology is comparatively new. Also in many ways on-line courses are explaining the methods of supporting learning. There are more unknowns in on-line learning support than areas of certainty. The technology is available but we still need to know how to exploit it effectively to enhance learning.

Jeffries (1998), reporting on a benchmarking exercise of learning centres in major corporate organisations, emphasises the importance of support. He suggests that the support role is often not fully developed. He identifies the underdevelopment of:

- specific subject support
- sign posting to other support
- post course support

Support is critical to the success of open learning.

15

LEARNING CENTRES

Over the past 20 years the use of learning centres has consistently grown in all sectors, so that it is extremely rare to find a college that has not developed at least one – and many large companies have opened whole networks of centres. In HE several universities have launched major learning centre developments. Over 200 public libraries have established open learning centres which provide access to open learning to the public and there is a growing number of community-based centres.

Learning centres come in a wide range of sizes, shapes and configurations. In some companies a simple cabinet of learning materials is called a learning centre, while several universities have centres based on a multi-storey building with hundreds of computers linked to the Internet with sophisticated support mechanisms. Several organisations are moving towards developing whole site (campus) learning centres based on a local network or intranet, while commercial organisations have launched what could be called virtual learning resource centres where customers can download material directly to their own computer. The US Virtual Campus has been launched in Europe; this provides online education and training in a variety of areas including communications, technology, information systems, management, marketing and finance. Courses can be customised for particular customers and learning can be accredited. British Aerospace (Thatcher, 1998) has begun a major investment to establish its own virtual university over the next ten years. The company aims to involve half of their employees (approximately 23,000) in the venture and integrate their existing 25 learning resource centres into the development.

In the main learners access their centre by making an appointment to use the facilities. In addition some centres offer a drop-in service to encourage learners to visit the centre. However, there is a reasonable amount of anecdotal evidence which suggests that the proportion of learners who drop in and then drop-out is high. Learners who visit a learning centre for the first time are often anxious and have only a limited understanding of how a centre works. They need support to help them feel comfortable. It is vital to ensure that learners return after their initial visit.

Centres offer a wide variety and combinations of services including:

- access to a range of learning materials covering a diversity of subjects
- loan of materials to facilitate home or workplace learning
- loan of computers and other equipment
- accreditation
- private study areas
- access to computers, video and audio equipment and Internet access
- mentoring support
- tutorial support.

Each centre provides a different set of services, depending on its role. Many centres do not offer a comprehensive range of services but are customised to meet the host organisation's needs. The success of a centre is clearly related to how well the centre serves the needs of its customers. It is difficult to be perfect first time and many centres have found the value of adopting a flexible approach with regular reviews of services and materials.

All the configurations of size and service discussed above could be learning centres. It will depend on the nature of the service they offer. Twining (1997) in a paper for the International Labour Office suggests that an open learning centre should provide:

- a friendly place
- opening times convenient for the learner or sponsor
- a distraction-free study environment
- a place to socialise with others studying similar programmes
- equipment and materials which it would be uneconomic to provide for one individual
- immediate general advice on many study problems.

He also considered the physical requirements of a centre to be:

- a reception area possibly combined with an area to socialise
- study areas with access to good-quality computer and other equipment
- private areas for tutor to student discussion and support
- a refreshment area.

Jeffries (1998), reporting on a benchmarking of 46 learning centres in commercial organisations, offered the following recommendations as best practice:

- learning centres should be accessible and relevant to a large proportion of workforce
- the role of the centre should be clearly integrated into the training and development strategy and practice
- a system for continuous improvement should be in place
- a friendly, welcoming learning environment should be created
- the centre should meet individual and corporate needs
- there should be effective learning support
- there should be a planned approach to materials acquisition.

The simple existence of a learning centre does not guarantee that it will enhance learning. The culture of the organisation is a powerful factor in the success of a learning centre. A centre opened in an organisation without a tradition of learning is likely to need extensive marketing to encourage individuals to use its services. There are examples of learning centres offering hobby-type (York, 1996) packages such as DIY skills, driving test, gardening and fishing to help re-establish a learning culture. The support of senior management is vital to the success of learning centres in most environments in order to provide adequate resources, encourage participation, provide an example and overcome resistance from other parts of the organisation. An approach widely accepted as effective is to develop the learning centre with the advice of a steering group drawn from a cross-section of the organisation staff and chaired by a senior manager.

The principal motivation behind the development of a learning centre depends to some extent on the organisation in which it is opened. A common reason is the belief that a learning centre can provide cost-effective learning opportunities. This is normally based on some basic research into other centres, advice of specialist suppliers of open learning and the example of initiatives in similar organisations. Although many centres undertake some form of evaluation this is often limited to records of use and materials borrowed rather an analysis of cost-

effectiveness. York Consulting (1996) in a review of learning centres reported that few evaluation strategies had been implemented.

The key evaluation criteria for a learning centre include:

- users (e.g. age, gender and occupation)
- participation rates (e.g. proportion of workforce or students)
- materials used or learning undertaken
- pattern of use (e.g. time)
- qualifications obtained
- length of stay and repeat use
- learners' attitudes
- benefits to learners and the organisation
- cost of centre
- cost of providing service conventionally
- benchmarking.

Other reasons for developing a learning centre are to widen course provision or attract non-traditional learners by offering a more flexible approach to learning. Part of the success of a learning centre depends on offering a different approach to learning so that individuals who normally do not take part in learning are now attracted. It is important to realise that learners need to be motivated and have sufficient learning skills to succeed at open learning. Potential learners need to be made welcome and to rapidly develop confidence so that they can succeed. The Open Learning Credits pilot (Crowley-Bainton, 1995) demonstrated the value of providing a quality open learning programme to long-term unemployed adults. Participants were drawn from a wide cross-section of ages, gender, occupations and periods of unemployment but overwhelmingly expressed satisfaction in their courses. Most of the participants had not taken part in a learning programme for many years. Twenty-seven per cent had obtained work after nine to ten months on the pilot. The pilot combined guidance, quality learning materials and support into a flexible package to meet the individual needs of the learner. This is the key to the success of any open learning programme and the challenge to the learning centre.

A wide range of benefits are claimed for learning centres, including:

- qualifications achieved
- reduced costs
- a wider range of learning opportunities
- developing learning skills
- confidence gained
- developing a learning culture or positive attitude to learning
- contiunuous professional development (CPD)
- organisational changes (e.g. sickness rates and turnover of staff)
- developing IT skills.

The degree of success depends on the particular centre and its objectives. There are a wide range of structures identified as learning centres and some do not succeed. It is not enough to simply fill a room or rooms with learning materials and computers and assume that people will come in and learn.

16

CASE STUDIES

Learning centres have been established in many locations by a wide range of groups and organisations. The case studies below give an insight into the nature of existing centres.

(i) Community learning centres

Small rural centre

The centre is based within a small rural community with little access to further or higher education owing to its location. The nearest college is approximately one hour's drive away and public transport is extremely limited. Frequently young people attending the college have no choice but to hitchhike or walk home from the nearest small town. In common with many other rural communities, young people tend to leave because of limited employment opportunities. Equally, women who are seeking to return to work have problems accessing education and training owing to the remote location.

The centre was established to assist the community in developing teleworking opportunities and facilities. The initial phase was to develop a population who had ICT skills: this was done through a mixture of distance learning with on-line support and a local self-employed tutor. Over the last two years the centre has trained 160 local people in basic IT skills and the first group has recently completed a more advanced course. In addition to IT, the centre has also been trying out some other open learning materials (e.g. accountancy and foreign languages). Although these have been successfully used, the centre has found it difficult to locate resources which are not simply introductory but cover more advanced topics.

The centre has established links to a local college and university and with a college offering a distance learning IT course.The centre's staff feel that there are significant cultural differences between themselves and the formal educational institutions. They particularly feel that the formal institutions are unable to give their learners the speed of response they need. The centre is able to quickly arrive at a decision while the formal educational institutions are perceived as slow and bureaucratic.

The key to the success of the learning courses is the peer support which has been developed in each group of learners. Each group has only five learners (owing to the limited size of the centre) and all the groups have formed powerful mechanisms for mutual support, allowing them to overcome the problems of the limited learning resources and support available to them.

Urban learning centre

The learning centre provides the opportunity to the local community to learn new and update existing skills and knowledge. It is based in the middle of a medium-sized town and provides access to a range of learning materials including extensive resources for learning IT applications. The materials cannot be borrowed for use at home.

The centre is open for six days a week for a total of 54 hours and learners need to join the centre in order to use the facilities. Computers, video and audio equipment can be booked for an hour at a time and access to the Internet is available for a charge. Individual members can chose to join the centre either by the month or the year and the use of the computers. In addition to the learning materials within the centre a series of evening events are also held. Video-conferencing has recently been made available

and is intended to allow the centre to provide additional services such as careers guidance, foreign language tutorials and links with FE colleges.

The centre has been used by many hundreds of people since it opened two years ago. Approximately two-thirds of the users have been unemployed adults and one-third employed. The age range of users has been 25 to over 60. By far the most popular purpose of joining the centre has been the learning of IT skills: mainly to learn how to use specific computer applications, develop basic IT skills or to use the computers to produce CVs and other correspondence. About 95 per cent of all learning activity is related to IT.

Evaluation of the learners' use of the centre shows a keen interest in accreditation and a desire to have access to formal tutorial support. This indicates that self-study is not meeting all the needs of the users of the centre.

(ii) Libraries

A rural library

The library authority in question was seeking a means of providing access for the community to the whole resource of the library which serves one large village and surrounding smaller villages. The authority had already established two learning centres in other libraries, originally as part of the 'Open for Learning' initiative. They were now seeking to develop a hybrid learning centre which provides access to training, information and education.

The service offers IT training covering all types of computer application for new and advanced computer users based on a modern multimedia computer. The centre takes part in the Government's IT for ALL programme and the BBC's 'Computers Don't Bite' campaign. Both have been useful in attracting new users. In addition to the IT material the centre also holds computer-based training on topics such as management development and CV writing. In the year since it started the centre has been used 1200 times and 300 hours of computer use has been logged. The library was assisted in the selection of learning materials by an open learning provider who is a member of the British Association of Open Learning.

In addition to the computer providing learning opportunities, the centre also offers two additional machines which provides access to:

- an image database of the contents of the County Record Office including digitised pictures, text and maps
- the social, historical and environmental materials and information held by the county.

The learning centre is a true learning environment in which users have access not only to a range of open learning materials but also to the wider resources held by the local authority.

Two urban libraries

The libraries operate in different parts of the same city and their open learning centres had been created as part of the Open for Learning programme. This had provided the funds to establish the basic service which consisted of a collection of open learning materials including computer-based learning packages and a computer. Learners had the choice of working within the library or borrowing materials to use at home. Both

centres have been maintained and developed although limited funds have restricted their expansion. Budgets have been available only for essential items and the librarians have struggled at times to obtain suitable products and to upgrade computer equipment. Both libraries also provide access to a database of learning opportunities available in the conurbation.

The layout of the centres reflected the space available at the two sites. The first library has sufficient space to provide two distinct parts of the library as a learning centre. In one area computers with an Internet link are available to learners who want to study using the computer-based learning (CBL) materials or to surf the Internet. In practice most of the CBL is borrowed for home use while the main emphasis of the computer facilities is the Internet. Individual learners make appointments to use the Internet (which is free of charge) and are given basic support by the library staff. The second area is devoted to open learning materials and is presented in an attractive way to make all users aware of it. Library staff are able to advise on materials selection but support beyond the initial choice is more *ad hoc*.

The second library has severe space restrictions, so that the open learning centre is limited to a small area with the computer provided in a separate room which also serves as a store room for the whole library. This computer does not provide access to the Internet. Both libraries have links to local colleges if learners want additional support or wish to work towards a qualification.

Both libraries have a steady flow of new users (e.g. three and seven new users respectively a month during 1997–98) as well as a foundation of established users. The stock of materials is heavily used with approximately a quarter on loan at any one time. The most popular subjects have been computing, typing, business skills, GCSE and child care/counselling. Material is exchanged between the two centres and decisions about new purchases and advertising are co-ordinated between them. Both libraries have taken part in initiatives such as the BBC's Computers Don't Bite which they found served not only as an introduction to computing but also as a means of recruiting new customers for their learning centres. The main motives of the learners tend to focus on matters of personal interest or work-related issues.

ICT is being developed to link the network of libraries together to provide wider access to the libraries' resources. This is mainly intended to support the work of libraries rather than to support learning. However, it is already clear that the service would also like to use telecommunications to deliver learning.

(iii) The commercial sector

Company 1

The company in this example decided to establish a learning centre for both economic and social reasons. They had experience of the cost and effects of undertaking programmes of training which they had realised were not completely effective. The expense was not confined to the cost of the external consultants who carried out the training but was also significant in terms of the staff time. The assumption that everyone needed the same training at the same time was often invalid.

Another key factor in deciding to develop a learning centre was the high proportion of professional staff employed by the organisation who needed to undertake continuous professional development (CPD). The centre was seen as an important way to contribute to CPD.

The learning centre was developed in conjunction with a small working group of staff and managers which considered the design of the centre before it was opened and now meet in order to monitor progress. The company worked with an external open learning provider which was a member of British Association of Open Learning. The provider's assistance was seen by the company as vital in establishing the centre and in selecting suitable learning materials.

The centre is made up of a medium-sized room which is divided into a number of areas such as:

- a relaxation area with coffee and literature about support for learning
- technology (the room was equipped with modern multimedia computers with Internet connections, as well as television and video, and audio cassette players)
- a study area
- a small group discussion area.

The learning centre has a variety of learning materials in a range of media (e.g. multimedia, workbooks, audio cassettes and videos). The learning material available tended to focus on IT skills, foreign language development and professional skills such as project management. There are funds available to meet other identified needs. The company has identified staff mentors to assist learners and although the centre has no full-time support staff the centre manager is based next door to the centre. Staff who use the centre are asked to complete a straightforward evaluation sheet to allow the facility to be continuously monitored. Learning materials can be borrowed by members of staff who have the choice of working on them in the centre or elsewhere.

The centre has been open for less than a year and although it has been consistently used, the initial high expectations of the developers have not been achieved. It is now clear that the culture in many parts of the organisation does not see learning activities as part of the working day so that staff are unwilling to use the centre. This is revealed in managers' attitudes to training generally and not simply in the context of the centre. This has just provided a means of identifying the problem. The learning centre team are now undertaking marketing activities to begin to change this culture.

Company 2

This company decided to establish a learning centre in order to meet the need for ICT training within the organisation. The main motivation was to reduce the high cost of external courses while continuing to meet the needs of individuals. They chose to ask a number of specialist IT training suppliers to tender to supply a range of ICT computer-based learning materials to meet their needs. The successful supplier was contracted for two years to provide and maintain ICT learning materials.

The learning centre consists of a private study area with individual booths mainly equipped with modern multimedia computers linked to a server on which the learning material is stored. The supplier loads and services the material and server. The contract assumes a degree of use of each package. The company have purchased a licence for a given number of staff to use each individual package. A total of 194 IT packages have been purchased from the suppliers and the company in addition has 19 other packs of IT related material and 158 other products. These are available in a variety of media and cover a range of subjects (supervision, foreign languages, management packages, personal development, project management packages and quality assurance). All the general material can be borrowed for use within the study area or elsewhere. The main focus of the study area is IT skills.

The learning materials are selected through the assessment of training needs by discussion with users followed by competitive tendering to a range of suppliers. The key criteria are the flexibility of the supplier, cost and quality. Quality was judged on the basis of staff reactions to products after they had been purchased.

The learning centre operates a loan service supported by a quiet study area of six study areas with computers loaded with ICT computer-based learning material. This is available for 12 hours a day. Access is by appointment and limited to one to two hours per session. Other materials can be borrowed for different lengths of time depending on the nature of the material.

Individual students have no access to support either in a general sense or specific subject expertise. The supplier provides a helpline but only to assist with technical problems associated with accessing its products. Bookings and loans are arranged by e-mail or telephone. Staff responsible for the learning centre are based at some distance from it.

The company believes the project is successful and monitors its use through a computer based monitoring system which forms part of their supplier contract. The success is mainly due to the high levels of personal motivation of their staff who need to acquire the IT skills in order to complete their work. However, for some of the higher-level IT skills there is a need for direct subject support (e.g. learning to programme in C++). Managers have difficulties in recruiting external support for these subjects.

Company 3 (national network)

The National Training Centre was established about four years ago. It produces national training packages, supports local learning resource centres (LRCs) and undertakes some traditional training. A current company reorganisation will increase its national function. The centre will be called Learning Development and is seen as being able to provide a service with consistent, auditable quality. The company has recently introduced annual appraisals which are linked to performance-related pay. All staff now undergo a performance assessment and development process which looks not only at immediate training needs but also at broader development/interests including the development of skills in languages, counselling and coaching. Technical training is seen as a job requirement, but while broader education/development is not an entitlement and must be related in some way to business objectives, employees are encouraged to use LRCs. The centres are asked to acquire the resources that employees desire.

The company has over 35 Learning Resource Centres (LRCs) which range from simple stocks of materials to sophisticated and well-resourced facilities. Each LRC is individually managed, with its own budget and independently able to purchase materials. Quality and consistency across the network is a problem. However, centres have an informal but widespread policy of sharing and borrowing materials among themselves.

The National Centre produces a range of workbooks and videos. It currently has approximately 60 print-based packs; 30 videos and three unsophisticated packages involving computer delivery of materials on disk or over the company intranet.

The overall approach to open learning is to integrate it with traditional training methods. Resource-based learning suffers from a cultural problem in the company as it is perceived as 'training on the cheap' or 'not proper training'. Staff expectation is for training to involve a couple of days away from the usual workbase. Some groups of staff are relatively resistant to IT: some of the company's managers believe that an employee using an LRC is 'skiving'.

A substantial proportion of company training is safety-related. The Health and Safety Executive is a key driver of the training programme (for example, workers

require refresher courses every three years on topics such as risk assessment and working at heights). A key issue here is auditability of the training provided and the imperative of establishing consistency across the company. Training delivered using information communication technologies which tests workers' understanding of what they have learned is seen as potentially very valuable.

Many LRCs are open to the families of employees and have general products like Encarta and AA Autoroute to encourage use. Some also operate loan schemes to provide laptops for employees to use at home. The need for proper support of LRC users is considered to be very important. This often takes the form of one-to-one inductions in lunch breaks. Formal training of LRC staff in guidance is regarded as unnecessary since many of these staff are company trainers. The National Centre is currently trying to compile a central register of materials available (to facilitate loans).

As part of the current re-organisation, learning development is linked with the company's IT service which is seen as potentially beneficial for the delivery of ICT-based training.

(iv) Colleges

Basic skills centre

This college provides a number of basic skills centres throughout the city in both college and community locations including local libraries. The centres operate on an appointment basis with learners enrolling for a course of study. Each learner agrees an individual workplan with a tutor which allows them to work at their own pace. This is negotiated continuously and normally involves accreditation through the Open College Network or other awarding bodies. Learners often have gaps in their knowledge and skills which require focused materials and activities rather than a general course.

The centre holds a range of resource-based learning materials including the NEC open learning titles. However, the general philosophy is that materials are not sufficient on their own and need to be supported by tutors. The college found some years ago that there was insufficient learning material available and decided to develop its own resource material. This is now commercially available.

The centre is open Monday to Friday for $5\frac{1}{2}$ hours a day and for two evenings. Learners attend the centre by appointment and follow an individual workplan. The local learning material provides them with questions, direction and self-evaluation. It provides a work scheme for them to follow. However, tutors will amend the work scheme to meet their individual needs. In addition to local published materials there is a large volume of individually-created worksheets and handouts. These tend to cover small topics and are intended to meet the gaps in individuals' knowledge and skills.

The centres have access to computers although they are not linked to the Internet. The computers appear to play a peripheral role in basic skills development. Their main role is to attract new learners since it appears easier to admit to being unable to use a computer than to having difficulties with words and numbers. There is interest in expanding their use in basic skills but the centres have not identified suitable computer-based materials and some tutors clearly doubt whether the approach will be effective.

Flexible learning centres

This centre was established as part of the overall college strategy to provide a more flexible access to learning. The learning centre is open for 49 weeks a year, Monday to Saturday for 10 hours a day, except on Saturday and Friday when the centre is used for induction and examinations. It has now been open for a year and has had 1,500 students. Currently, 750 students are enrolled learning IT skills and foreign languages. The centre is the hub of a developing network of local learning centres situated in the community. Currently there are three outreach centres which will expand to twelve by next March. Some of the centres will be linked to the hub by videoconferencing to provide additional support to local learners.

Learners have to enrol on a course of study and to book time within the centre. They are free to start at any time during the year and to study at the speed which suits them. Their enrolment lasts a year but learners are free to carry on into a second year on the payment of an extra fee. Staff are available in the centre to provide subject support at all times. The foreign language courses are marginally constrained by the need to co-ordinate student attendance with the availability of tutorial support. Each student is also provided with a personal tutor.

Charges are broadly similar to other FE courses with concessions offered to unemployed people and other groups. The full cost includes a basic fee of £5 per hour to use the centre. Students would need to pay course fees in addition to this basic charge to cover the cost of assessment and other costs.

The college is rapidly developing the learning centre and is aiming to expand the service to include basic skills and courses to meet local skill needs. The college is investigating various approaches to basic skills including the use of integrated learning systems.

Multiple site college

This college has established learning centres at all its three main sites. Each centre offers the same range of services to learners providing access to computer facilities including Internet links to allow them to word-process and print their work and also to run computer-based learning packages. This is supported by a large library of books and materials including study skills packages. The centre provides quiet study areas for individuals and groups of learners. When students initially enrol they are assessed so that they can be provided with appropriate support. This includes the use of PLATO, an integrated learning system to help develop basic skills.

The centres are open Monday to Friday for $11\frac{1}{2}$ hours each day except Friday when it is open for $7\frac{1}{2}$ hours. The students, mainly drawn from the local community, include both open learning and conventional course members. All students have access to a large volume of material in a variety of media including a large audio-visual collection. Most material can be borrowed, with the exception of videos. In each learning centre there is a specialist key skills learning facility.

The centres cater for between 100 to 1,400 students each day with an average of 15 using the key skills resource. Support is provided at many levels, including:

- on-line support from computer-based learning materials
- subject support from specialist librarians and their assistants
- one-to-one support with key skills development
- an individual mentor
- advice and guidance with careers and personal problems.

Throughout the college there are several hundred computers available for student use. Within the learning centre access to the Internet is available by appointment from 10 computers.

(v) University

Mathematics learning support centre

This centre was established two years ago to provide mathematical support for undergraduates, primarily during the foundation and first years of their courses. Many undergraduates are either returning to education after a break of several years or are from non-traditional routes and have limited mathematical preparation for their studies.

The centre is based in the university's Department of Mathematical Sciences and offers a welcoming and supportive environment for students who are seeking help with their studies. Many students are undertaking engineering and science courses which require a sound foundation in mathematics. However, other students seek help prior to starting employment or with the mathematical tests that many employers are now asking them to take.

The resources available to learners cover:

- one-to-one support each afternoon that the centre is open (i.e. each day during term time)
- open learning materials (i.e. both developed within the university and purchased from commercial sources such as the University of Sunderland)
- computer-assisted learning (i.e. TLTP materials and commercial products)
- a wide range of specific handouts (i.e. foundation and first year mathematical content has been broken down into many handouts, each covering a specific topic)
- textbooks
- videos.

In addition to these resources the centre is developing a website on which new students prior to starting their courses can access learning materials and communication links to the centre. The materials are prepared using LaTex, a mathematical typesetting package and converted into Adobe Acrobat format.

The individual handouts have proved to be extremely popular because they cover specific topics about which students are concerned and are designed to be readable. The handouts are also available over the university network in many of the campus student computer laboratories. The handouts cover:

- foundation content
- common first-year topics
- more advanced topics
- GCSE mathematics.

Some of the larger computer-assisted learning (CAL) packages have been of limited benefit because they cover the entire first year course while the need is often for help with a specific topic. The other major limitation is that to use them would require students to have access to more computer time on facilities which are already heavily used.

A key problem in developing CAL for standalone or Internet delivery is how to represent mathematical symbols. Packages such as LaTex allow the university to present symbols but currently there is no satisfactory way for students to write answers using mathematical symbols. This limits assessment to multiple-choice type answers.

The centre has a range of computers available for student use within the centre including two Pentium PCs and two Apple Macintosh computers specifically bought for the centre. Each computer has a range of CAL material loaded as well as a range of mathematical tools (e.g. Derive, Maple, Excel and Matlab). CAL packages include:

- Transmath
- Mathwise
- Calculus Connections
- AtivStats.

The two PCs are able to access the Internet and an older PC provides a link to university network CAL resources.

A drop-in surgery is available each afternoon between 2 pm and 5 pm Monday to Thursday and 6.30 to 8.30 pm on a Thursday. This has been very successful in helping students overcome specific problems. In addition workshops have been regularly provided on important topics in first-year engineering mathematics such as calculus, algebra, vectors, matrices and complex numbers.

The centre is the focus for diagnostic tests of first-year engineering students. The tests identify students who needed to visit the centre and teaching staff are informed of areas of weakness.

Flexible learning

The university has made a major commitment to develop the use of flexible learning to support and deliver its courses. In a sense the aim is to develop the whole campus as an extended learning centre. The medium-term objective is to network the halls of residence so that students have access to learning materials from their rooms. The initiative has gathered speed over the last year with the appointment of officers to consider the use of computer assisted assessment, development of support services and the use of TLTP materials from a central server. The principal developments have been paper based materials, standard workshops and customised events for individual departments.

All new students receive a series of guides covering study skills. An introduction to the use of IT and a wide range of advice is available from the flexible learning centre. In addition, the flexible learning unit has produced a number of self-study introductions to particular software applications such as Word and Excel. These packs are sold to students at the cost of reproduction. Part-time students are particularly keen on the packs and advice sheets.

The unit aims to produce high-quality products that cover a wide range of issues. It offers packs covering topics such as how to read effectively, how to make an oral presentation, electronic information sources within the library, note taking and revision.

Over the last two years the university has been evaluating through departments all the TLTP materials which cover the subjects they offer. Most have been found to be useful. However, the quality of material is variable. The material has been used as a replacement for a lecture, a supplement to existing learning and a revision aid. In the main it has taken time to integrate the material into existing courses (approximately 18 months). It is far easier to start with a new course than an existing one since there is more flexibility in designing a new course. An existing course has many fixed elements which are difficult to change or which lecturers are unwilling to alter.

The other barriers which have been encountered are:

- some learning material was not designed for network delivery
- some is only available on Apple Macintosh computers (although a small number of products have both PC and Apple versions)
- there is little designed for Internet delivery
- there are doubts about the quality control of learning material on the Internet
- websites frequently disappear.

Learning resource centre

This centre is based at a new multi-site university which attracts a high proportion of part-time and local students. On the site where the learning centre is based the majority of students are part-time. The centre is less than two years old and provides a multimedia learning environment for students as well as serving as the university library. The centre is open to all students regardless of the type of course they are undertaking.

The centre provides 450 work spaces, 170 open access work stations, scanners, printers, internet and network access and other services. This is available within a large open plan building with areas designed to stage events. The resources are situated on three floors. The university has other learning centres.

The students are supported by a range of staff including computer technicians, help desk staff, librarians and media services. The intention is to have a centre open 24 hours a day, seven days a week, but hours are in practice more restricted. From Monday to Friday the centre is open from 10 to 13 hours a day while at weekends it opens for five hours each day. During university vacations the centre remains open but hours are reduced. Individual services are not necessarily available when the centre is open.

All students are provided with an e-mail address and have access to a range of modern computer applications (e.g. Microsoft Office). The centre provides a variety of specialist reference databases either on-line or in the form of CD-ROMs and the library catalogue is available on-line.

Materials of all forms are purchased by the joint decision of teaching and centre staff. Teachers send lists of material in all forms which relate to their courses and centre staff buy the essential items. There is little systematic evaluation of material and most purchases are heavily used because they are recommended to students by their teachers.

(vi) Career service

The centre provides free access to anyone who wishes to use the centre, which is open during the normal office hours of the career service. Individuals are frequently referred to the centre after a guidance interview or from the local Jobcentre. Clients have been drawn from the self-employed, unemployed and employed populations, although the majority are unemployed. Clients are drawn from all age groups including young adults and older learners.

The learners are normally referred to the centre and have access to the facilities by booking appointments. The centre consists of two areas: a private room near reception which also serves as a careers library and a small area in reception containing a rack of learning material and a single computer which is available for client use. The size of the learning centre limits the number of customers who can access the centre at any one time to four or five learners.

The emphasis is on providing many of the learners with a taster of a specific subject so that they can decide if they want to go further with it. The centre is aware of other facilities within the town and will refer clients to other centres or providers if this is appropriate. A regular need is to help an individual immediately prior to starting a new job to try out a computer application such as Excel which they will be using but have no experience of.

Within the centre a member of staff is available who arranges the client appointments and advises them on the availability and suitability of material. The support worker provides general assistance.

The centre provides access to three modern PCs linked to a laser printer. However, currently they have no access to the Internet. The centre holds stocks of both computer and paper-based materials covering a wide range of subjects. The material covers the range from basic skills to NVQ III. The most popular packages are keyboard skills, information technology and CV Writer.

The centre's catalogue lists 58 packages covering a range of subjects such as information technology, basic skills, accountancy, supervision, foreign languages and interviewing skills. The centre's leaflets and catalogue give many examples of packages and their target audience.

With hindsight the centre staff believe that they bought a wider range of materials than they needed. This was partially due to the time pressure when the project started and simply lack of experience of operating a learning centre. Learning material was supplied by an open learning distributor who is a member of BAOL and their advice is valued.

17

Summary of Key Findings

Suppliers

- Suppliers of open learning are relatively small organisations or small parts of larger companies. However, larger organisations are developing, based on the amalgamation and takeover of smaller companies. There are several IT courseware suppliers who are significantly larger than the norm for open learning companies. Overall the developers and suppliers are mainly small and medium-sized enterprises.
- There is a tradition of co-operation between suppliers and large users of open learning.

Users

- Some large companies are users, developers and commissioners of open learning materials.
- There is a clear relationship between size of company and the use of open learning. The larger the company the more likely it is to use open learning.
- The use of open learning varies considerably between different sectors of the economy (e.g. high in finance and low in construction).
- The open learning market is divided into a number of sectors.
- The use of open learning in HE and FE varies considerably between and within colleges.
- Public access to the Internet is related to the cost of use. Charging for access will significantly reduce use.
- The dissemination of good practice and experience between and within sectors is limited.
- The training of tutors is essentially to ensure the effective use of ICT in learning.
- There are relatively few opportunities for teachers and trainers to receive training on the design and use of open learning and specifically in relation to ICT.
- Learners' attitudes to open learning are not always positive. It is sometimes seen as a cheap option.
- Basic skills tutors believe that most learners need individual support regardless of the nature of the learning materials.

Materials

- The price of learning material is variable, some advanced IT learning modules being priced from £500 to £1,000 while office application tutorials are available from £25 per pack. Pricing is complicated by licensing which is charged on the basis of the number of users although site licences are usually available.
- Few packages seem to address the needs of the first time ICT user.
- The availability of high-quality professionally produced learning materials is limited. There is no guarantee that all subjects are covered and the national stock tends to follow the market. IT, management subjects and foreign language learning are all well supplied but other areas are less available.
- Information about open learning titles is not always easy to locate.
- Teachers and trainers prefer materials which can be adapted and modified to suit their learners' precise needs.
- The adaptation and modification of commercial learning material is normally not possible owing to copyright restrictions or technical limitations.

- There is a trend towards making learning materials available over a network or intranet.
- Integrating open learning approaches into established courses and institutions is a slow process and anecdotal evidence suggests that at least 18 months (and possibly as much as three years) is needed to establish the approach.
- The design of learning material for NVQs should reflect the learning process rather than the standard.
- Basic skills open learning materials are normally paper-based with very few multimedia products. There is a limited choice of commercially produced materials although there is a considerable body of locally produced materials in the form of worksheets and handouts on individual topics.
- The ILS approach is worth investigating to deliver basic skills.
- The availability of open learning materials to support the achievement of NVQS is limited.
- IMS projects aim to produce standards to allow different learning resources and systems to work together.

Learning centres

- Access to expert assistance and advice on materials and good practice is important for establishing an effective learning centre.
- Organisational culture is extremely powerful in determining the degree of use of a learning centre.
- The relationship between size and learning effectiveness is complex. A large centre does not necessarily provide more effective learning than a small centre and the reverse is also true.
- Learner support is essential for the success of a learning centre.
- The evaluation of materials is frequently neglected and few organisations carry out a systematic evaluation of materials before they buy them. Assessment of materials in use is normally based on subjective feedback from users.
- Peer support is a powerful mechanism to aid open learning.
- The advice of a representative steering group during the establishment of a learning centre is valuable.
- A key factor in deciding to establish a learning centre is the belief that they are cost-effective.
- A network of centres needs to have a consistent overall approach in order to maximise their impact.

Information

- There is a considerable body of research evidence and good practice in the application of Open Learning.
- Flows of information between different market sectors and within sectors are fragmented.
- Although there is considerable interest in and much effort made to research on-line learning, understanding of the approaches is only just beginning to emerge. There is a considerable need to systematically investigate on-line learning methods.

Other aspects

- Small organisations and individual learners may perceive larger organisations as slow and bureaucratic.
- Taster programmes are often effective in attracting new learners.
- Learning centres and open learning can be successful with non-traditional learners.

REFERENCES

Allred, J 1997, *Open Learning in Public Libraries: Third Baseline Survey*, Department of Education and Employment, research report No. 19

Base, http://www.base.odl.org/controlE.html

BECTA, 1998, *The UK ILS Evaluations*: Final Report, British Educational Communications and Technology Agency

BIMA 1998, *Who's Who in UK Interactive Media 1998*, DP Media and BIMA

Calder J et al. 1995, *Learning Effectiveness of Open and Flexible Learning in Vocational Education*, Department for Education and Employment

Cambridge Learning Systems Ltd 1997, *Learning Centres: A Guide*, Department of Education and Employment

Clarke, A 1997, *The Principles of Screen Design for Computer-based Learning*, Department of Education and Employment

Coffey J. 1990, *Contracting for Quality in Learning* (c 1990; publication details unknown)

Crowley-Bainton, T 1995, *Evaluation of the Open Learning Credits Pilot Programme: Summary Report*, Employment Department, Research Series No. 45

Davies, W.J.K 1989, *Open and Flexible Learning Centres*, NCET

DfEE 1998a, *University for Industry: engaging people in learning for life*, Pathfinder Prospectus

DfEE 1998b, *The Contribution of Higher Education to the University for Industry*, Higher Education and Employment Division

FEFC 1998, The Use of Technology to Support Learning in Colleges, National Survey Report, Further Education Funding Council

Guildford Educational Services Ltd 1997, *The Education and Training Multimedia Market in the Uk*, Report for the MESO Project

Hunt, M and Clarke, A 1997, *A Guide to the Cost-Effectiveness of Technology-Based Training*, Department for Education and Employment

IRDAC report 1994, *Quality and Relevance*, European Commission

Jeffries, C 1998, '*Benchmarking Learning Centres*', *Open Learning Today*, Journal of the British Association of Open Learning

Lewis, R 1986, *Open Learning*

McMillan Partnership Ltd, http://www.mcmillanpartnership.ltd.uk/

Morton, S and Trigg, A 1997, *Have Disk Will Travel: A national guide to local computing providers for Open University students*, The Open University

NCET, ILS: *Integrated Learning Systems. A report of Phase II of the pilot evaluation of ILS in the UK*, National Council for Educational Technology

Neilson, I, Billington, A, Charlton, C, and Little, J 1998, *The Internet Express: Case Study on On-line Public Access and Training*, in proceedings of the Network Lifelong Learning conference, University of Sheffield

NOP 1992, *Employer Flexible Access and Use of Open Learning in Britain*, NOP Social and Political, Department of Education and Employment

Patrick J., Michael I, and Moore A. 1986, *Designing for Learning*, OSL

Pergamon 1994, *Open Learning Directory 1994*, Pergamon Open Learning and the Employment Department Group

Riding R 1993, *A Trainer's Guide to Learning Design*, Learning Methods Project Report OL201, Learning Methods Branch

Sanderson 1997, *The OFL-CD: The database of open, flexible and resource based learning*, DfEE, NTICS and Sanderson.

Sheffield College 1997, *A Resource Audit at the Sheffield College Supporting the Delivery of Training of Information and Communication Technologies (ICT) to SMEs*, Sheffield College

STA 1988, *Resourced Open Learning Facilities*: A Guide, Skills Training Agency

Technologies for Training. http://www.tft.co.uk

Thatcher, M 1998, 'Campus fugit', *People Management*, September

TLTP, http://www.tltp.ac.uk

TFPL 1997, *The Multimedia and CD-ROM Directory* 18th Edition, TFPL multimedia Ltd

Tomes, N and Higgison, C.A 1998, *Talisman Training Needs analysis, a report for the Scottish Higher Education Funding Council*, Heriot-Watt University

Virtual Training Library, http://www.thebiz.co.uk/virtual-training-library/

Walmsley, J 1997, *Designing Open Learning for Occupational Competence in Implementing Flexible Learning*, Kogan Page

Welchman R, 1989, *Individuals and the Open Tech Programme*, Tavistock Institute

OPEN

MATERIALS
and learning centres

ALAN CLARKE AND JOYCE WALMSLEY

The development of the University for Industry and the National Grid for Learning has focused attention on the availability of open learning materials and their use in learning centres. This report is based on an investigation into the national stock of open learning products and a review of a wide variety of learning centres. It was undertaken on behalf of the Department for Education and Employment during 1998.

A wide range of individuals and organisations contributed to identify the nature and availability of open learning materials. The market for published materials was considered and analysed to reveal several sub-markets with limited flows of information between them. In many ways they operate as independent markets. Although there is a substantial stock of materials the balance is skewed with some subjects having hundreds or even thousands of titles while others have relatively few. This imbalance is largely the result of the commercial nature of the market. Most products are paper-based, reflecting their development over the last two decades. Computer-based materials are becoming more widely available but currently represent only a small part of the market.

A wide range of learning centres was visited, either within companies or in community locations, colleges or universities, and factors in their success identified. The report gives a number of miniature case studies of different types of centre. The importance of learning support is highlighted and the potential for information and communication technologies to add value to existing approaches identified.

NIACE D/EE

NIACE, the national organisation for adult learning, has a broad remit to promote lifelong learning opportunities for adults. NIACE works to develop increased participation in education and training. It aims to do this for those who do not have easy access because of barriers of class, gender, age, race, language and culture, learning difficulties or disabilities, or insufficient financial resources.
Registered charity number: 1002775
The NIACE website on the Internet is http://www.niace.org.uk

ISBN 1 86201 071 4 Price £6.95

ISBN 1-86201-071-4

9 781862 010710

65